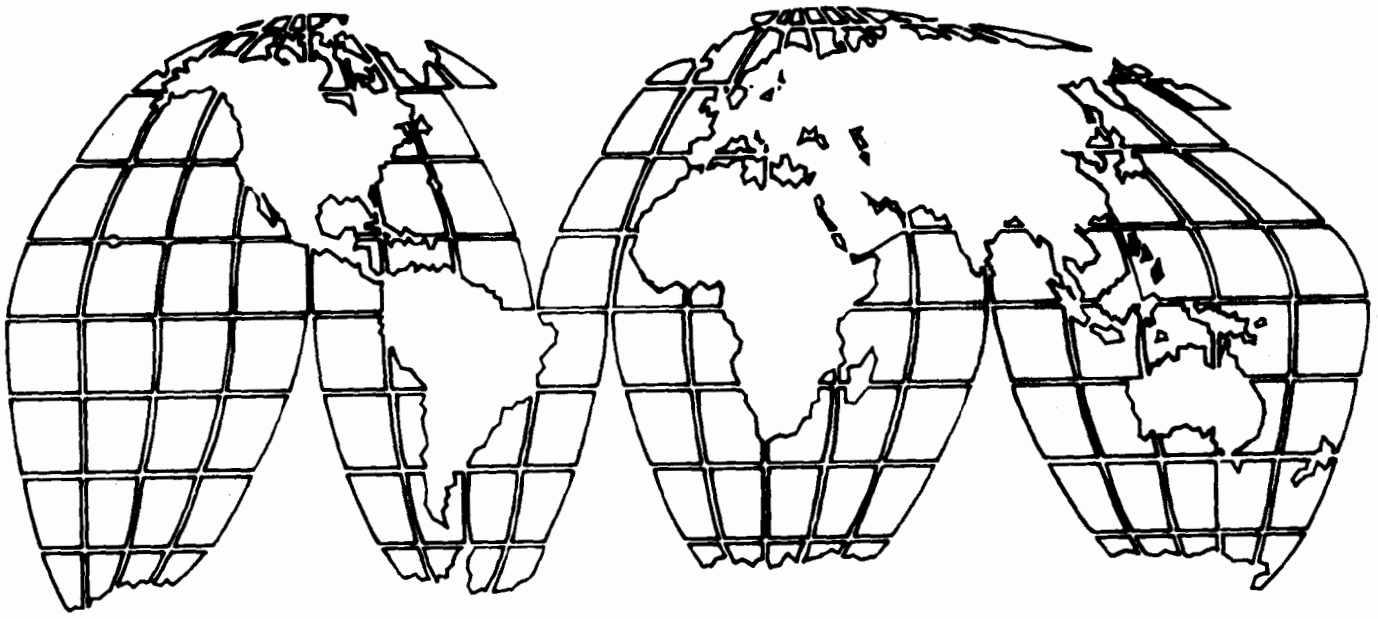
A.I.D. Project Impact Evaluation Report No. 18

Philippines: Rural Roads I and II



March 1981

Agency for International Development

PN-AAH-973

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(continued inside back cover)

PHILIPPINES: RURAL ROADS I AND II

PROJECT IMPACT EVALUATION NO. 18

By

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Agency for International Development

March 1981

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FOREWORD

In October 1979, the Administrator of the Agency for International Development requested that, in preparation for an Agency-wide ex post evaluation system, between 20 and 30 projects be evaluated during the subsequent year, focusing on the impact of these projects in several representative sectors of the Agency's program. These impact evaluations are to be performed by Agency personnel and result in a series of studies which, by virtue of their comparability in scope, will ensure cumulative findings of use to the Agency and the larger development community. This study of the impact of rural roads in the Philippines was undertaken as part of this effort. A final evaluation report will summarize and analyze the results of all the studies in each sector, and relate them to program, policy and design requirements.

PREFACE

None of the three team members had ever visited the Philippines prior to this evaluation. While this fact may have guaranteed an unbiased point of view, it also meant that we were terribly dependent upon the assistance that we would obtain in the country itself. Fortunately, we could not have asked for better support.

The Mission Staff facilitated our travel and anticipated our administrative needs. Interviews were arranged, secretarial help provided, professional staff made available, all most generously, so that we were able to squeeze the most out of a short three week visit. Our special thanks go to Richard Flaspohler, the Project Manager for the Rural Roads Program, and Ricardo Arnaldo, who coordinated these Mission efforts, and gave of their own time far more than we could have asked or expected.

We would like to thank all of those at USAID/Manila who helped us in the capital city and, in particular, Terry Fernandez, Rene Camina and Leonardo Dayao who accompanied us on our visits to the project sites. Our schedule was hectic and our demands strenuous, but everyone contributed with unfailing good humor.

We had outstanding cooperation and assistance from officials of the Ministry of Local Government and Community Development in Manila, and from provincial officials at all of the project site areas. We shall not soon forget their many kindnesses.

Finally, we owe special words of appreciation for the work performed by Josephine Alviar and John McAndrew, both contractors, and Thomas Hobgood, an IDI on the Mission staff. These three were our ears and mouths in the countryside and they also made major contributions to the findings and conclusions of this report. It is no exaggeration to say that without their participation we could have accomplished nothing.

SUMMARY

This report evaluates the impact of the A.I.D.-supported Rural Roads Program (RRP) in the Philippines. Two A.I.D. loans totalling $39 million were approved in 1974 and 1978, respectively. A major goal was to improve economic and social conditions among the rural poor (1) by reducing transport costs for farm inputs and outputs and (2) by improving access to social, educational, and recreational activities. Another goal was to strengthen the engineering and socioeconomic planning/analysis capabilities of the provincial governments implementing the program, thus decentralizing some of the power in what traditionally had been a highly centralized governmental structure.

From a total of 69 completed or nearly completed road projects, the evaluation team selected eight projects representing different geographic areas, types and lengths of road, cropping patterns, and distances from major markets. The projects were also selected to include both roads completed early in the program and those recently completed or nearing completion. A ninth road site was visited to field-test the questionnaires developed by the team.

The overall impacts of the projects visited ranged from almost nil to dramatic. The great majority of rural residents interviewed claimed to have benefited from road construction, if only because it provided easier, less time-consuming access to places visited for business or leisure purposes. We encountered no one who claimed to be worse off because of the road, though in one site some small farmers were being threatened with eviction because of events associated in part with the road. It is possible, too, that in another site, tenant rice farmers had been displaced because of road-associated activities.

The road projects almost always stimulated increased competition among vehicle drivers and brought more marketing intermediaries -- offering higher prices -- into the communities served. Also, more people were able to market their produce directly. Transport costs reductions, however, appear to be modest. Other economic benefits included better price information and reduced spoilage because of the ability to sell products during the rainy season, and on roads that caused less damage in transit. The road projects also stimulated some shifts into higher-value fruits and vegetables, but less than the team expected to find.

The New Directions Mandate of 1973 makes it important that A.I.D. be concerned not only with the magnitude of project benefits but also with their distribution. The project papers, unfortunately, adopted a naive criterion that did not in fact ensure that benefits would be concentrated on the rural poor, as was claimed. We found no evidence that the project significantly altered the distribution of rural income and wealth.

The social, educational, and recreational benefits of the project were modest in general and very minor for education and recreation. In the case of health, the road projects had a significant impact in many communities on the frequency of visits by doctors or nurses; but even more important to rural residents was the quicker and better access they had to doctors, clinics, and hospitals in neighboring towns, and beyond. Government infrastructure activities (electricity, drinking water, irrigation) and other services (e.g. agricultural extension) were expanding in some areas, but in most cases this was not attributable to the RRP.

Most rural residents interviewed by the team perceived important but difficult-to-measure "quality-of-life" benefits from the RRP. These included reduction in travel time, more comfortable rides, and year-round ability to reach nearby towns by motorized transport for medical and other emergencies. In addition, some rural residents regarded roads as representing "development" or "progress."

The institutional impact of the RRP was disappointing, though it should be recognized that the goals established were very ambitious. Road construction was satisfactory, but maintenance was inadequate. Feasibility studies were not of high quality, and provinces were generally not keeping up-to-date on their evaluation schedules. Most provinces were having difficulty in attracting and keeping qualified professionals for their engineering and socio-economic planning/analysis staffs. Road selection decisions were made primarily by the provincial governors and were based primarily on political rather than economic considerations, though the RRP requirements did limit the scope within which such political decisions could be made.

The principal conclusions, lessons learned, and policy implications of the RRP were as follows:

1. Criteria for site selection must be more precise than those in the RRP if benefits are to be concentrated on the rural poor.

2. The institution-building objectives of the project were partially achieved. Provincial planning/analysis and engineering staffs, though still weak, have been strengthened and decentralized decision-making appears to have been achieved. However, these objectives imposed a heavy manpower burden on the country. A smaller number of regional engineering and development staffs, rather than staffs for most of the country's 73 provinces, would have been more cost-effective, though this might have compromised political decentralization objectives.

3. The project design was strongly biased in favor of capital-intensive methods. Possibilities for community-based, labor-intensive road construction should have been considered.

4. Feasibility studies were weak and had little effect in determining road construction priorities. More technical assistance would have been desirable to improve the quality of, and explicitly incorporate equity considerations into, these studies.

5. Road design standards were too high for prevailing conditions. More attention should have been given to local conditions and less reliance placed on U.S. standards.

6. The impact of the RRP would have been greater had construction or improvement of provincial roads been integrated with improvements to the barangay (township) roads linking more isolated communities with the provincial roads.

7. There was very little community involvement in the planning, construction, and maintenance of rural roads. Such involvement would have facilitated use of labor-intensive construction and maintenance techniques and brought more benefits to the rural poor.

8. The greatest impact -- and probably the highest rates of return -- in the RRP appears to have been provided by the construction of penetration roads (rather than feeder roads) and bridges.

9. The impact of the RRP would have been greater had it been better coordinated with other rural development programs.

10. The Fixed Amount Reimbursement (FAR) scheme was, on balance, a positive aspect of the program that merits consideration in other A.I.D. projects. Modifications are needed, however, to overcome inherent biases penalizing poor and financially weak local governments.

GLOSSARY

A.I.D.	Agency for International Development.
AIP	Annual Implementation Plan.
barangay	In rural areas, a village and its surrounding farmland; roughly equivalent to a U.S. township.
barong	Tropical shirt similar to a guayabera.
barrio	Interchangeable with barangay.
barrio captain	Roughly equivalent to a village headman or village mayor; an elective office until 1972, since which time there have been no elections.
B/C	Benefit/cost.
buri	A type of straw from which hats are woven.
carabao	Water buffalo.
CIP	Capital Improvement Program.
CLT	Certificate of Land Transfer.
FAR	Fixed Amount Reimbursement.
feeder road, major	Defined in the project paper for RRP I as a road serving as "a main access route to agricultural areas connecting poblaciones and produce collection centers to the primary road network."
feeder road, minor	A road serving "smaller producing areas and cooperatives ...in general closed part of the year or ... very difficult to negotiate in the rainy season. Traffic levels are moderate to low." (Project paper for RRP I.)
IRR	Internal Rate of Return.
jeepney	A mini-bus built on a jeep frame.
MLGCD	Ministry of Local Government and Community Development.
MPH	Ministry of Public Highways.
NGA	National Grains Authority.
NIA	National Irrigation Administration.
nipa	A type of palm, or thatch made from that palm.

Palayan ng Bayan	A government program under which provincial governments are to set aside land to grow rice for their own employees, who will receive it at subsidized prices; private firms employing more than 500 workers have the same legal obligation.
penetration road	"Penetration roads usually involve new construction or improvement of low standard roads or tracks. Penetration roads can open up entirely new areas of settlement or serve areas where cash crop production is very small due to lack of transport facilities." (Project paper for RRP I.)
PDS	Provincial Development Staff.
PEO	Provincial Engineering Office.
poblacion	Town, especially a county seat.
RRP	Rural Roads Program.
sari-sari store	A small store selling basic bottled, canned, and packaged goods.
tricycle	A motorcycle with sidecar used for transporting passengers (up to 10) and goods.
USDH	United States direct-hire (i.e., foreign or civil service) employee.

PROJECT DATA SHEET

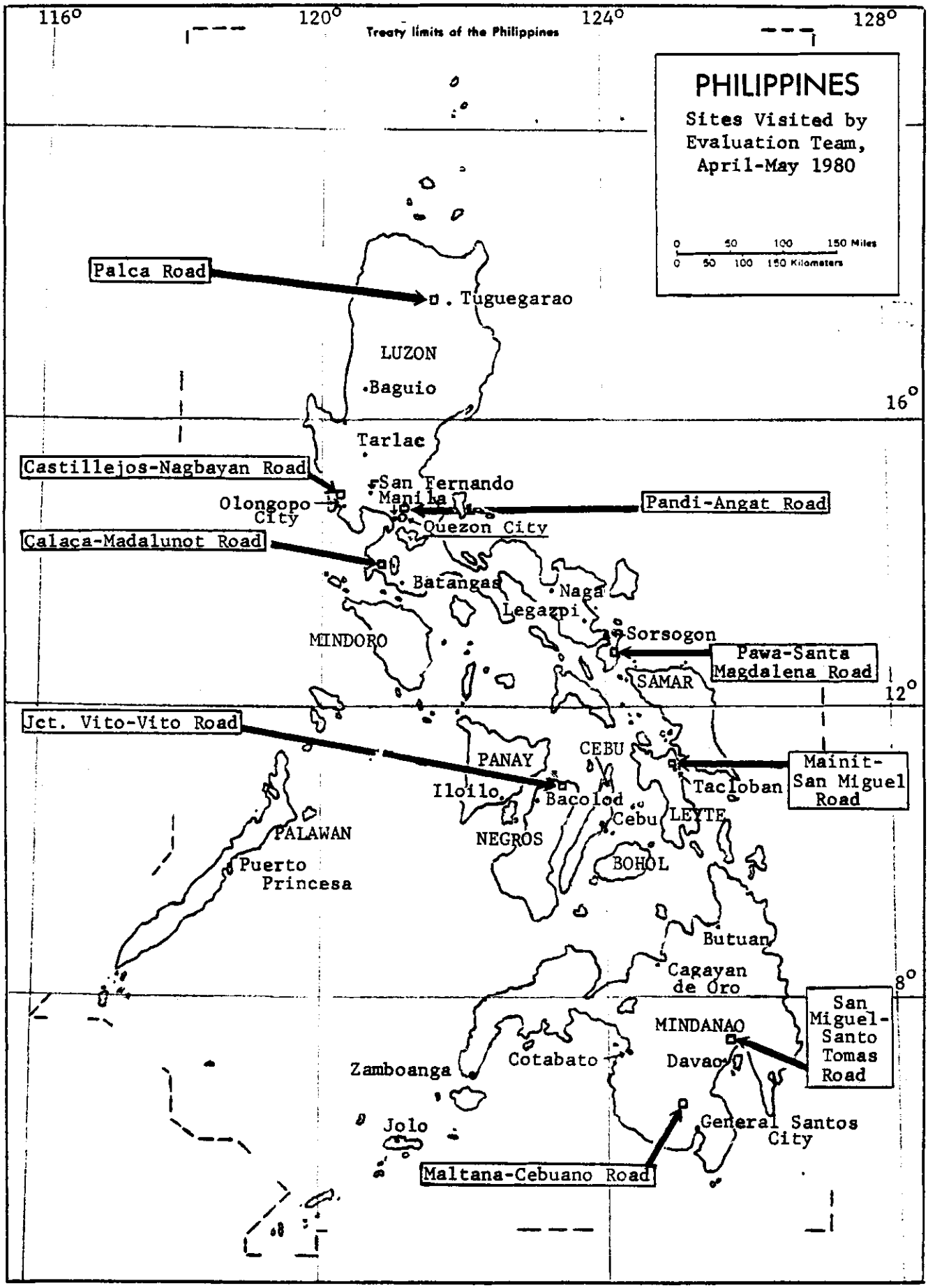
RRP I and RRP II
(U.S. Dollars)

	RRP I (Project #492-0272) (CY 1976-1978)	RRP II (Project #492-0297) (Through CY 1979)[1/]
Number of Roads	146	137
Number of Kilometers	406.2	388.2
Estimated Total Cost (excluding overruns)[2/]	$10,982,000	$10,466,000
Cost Per Kilometer	27,035	26,960
Number of Bridges	167	134
Number of Lineal Meters	4,233.4	3,039.4
Estimated Total Cost (excluding overruns)[2/]	$9,016,000	$8,992,000
Cost Per Lineal Meter	2,130	2,960
Number of Provinces in the RRP	28	55[3/]

[1/] Completed projects only.

[2/] Based on the Fixed Amount Reimbursement (FAR) payments made to participating provincial governments. These amounted to a maximum of 75 percent of estimated total construction costs, excluding overruns which were absorbed by the provincial governments. Complete data on cost overruns were not readily available. The exchange rate used to convert pesos to dollars is 7.35 pesos = US $1.00.

[3/] As of April 1, 1979. Includes six Rural Service Centers (independent cities which include rural areas).


116°
120°
124°
128°
Treaty limits of the Philippines
PHILIPPINES
Sites Visited by Evaluation Team, April-May 1980
0 50 100 150 Miles
0 50 100 150 Kilometers
Palca Road
Tuguegarao
LUZON
Baguio
16°
Tarlac
Castillejos-Nagbayan Road
San Fernando
Olongopo City
Manila
Quezon City
Pandi-Angat Road
Calaca-Madalunot Road
Batangas
Naga
Legazpi
Sorsogon
MINDORO
Pawa-Santa Magdalena Road
SAMAR
12°
Jct. Vito-Vito Road
PANAY
CEBU
Mainit-San Miguel Road
Iloilo
Bacolod
Tacloban
Cebu
LEYTE
PALAWAN
NEGROS
Puerto Princesa
BOHOL
Butuan
Cagayan de Oro
8°
San Miguel-Santo Tomas Road
MINDANAO
Zamboanga
Cotabato
Davao
Jolo
General Santos City
Maltana-Cebuano Road

I - PROJECT SETTING

The seven thousand Philippine islands lie half a world away, between the South China Sea and the Pacific Ocean. Manila, the capital city of this country of 48 million people, is a modern, sprawling metropolis. New office buildings and shopping centers dominate the chic Makati section where the wealthy and much of the foreign colony live. In the mid-town area, near the harbor, Hiltons, Ramadas, and Holiday Inns service the hundreds of Japanese tourists who have come to spend a few eye-winking days and nights on the town. There are modern cultural centers, fancy shops and restaurants, pimps, and striking bank buildings; Shakey's Pizza Parlors, elaborate children's hospitals, noisy discos, and open sewers; newspapers and color TV -- almost all in English; Bach and "Over The Rainbow" on Sunday afternoons in Rizal Park; and everywhere, the streets crowded and noisy with cars, buses, and jeepneys, those gaily decorated mini-buses which combine a basic jeep frame with a large amount of Filipino artistic imagination. The legacy of a half-century of American domination is readily apparent.

At the outskirts of the city begins the vibrant green of lowland rice country. Beyond are lands sown with coconut, corn, sugar cane, root crops, and pineapple. This is the land of the carabao, the ox-like work animal of the Philippine countryside. Here the languages are Tagalog, or Waray or Ilocano, or any of the dozens of others spoken in the islands. In this setting, so different, the farmer-owner or tenant works his few hectares. If he is fortunate, he has irrigation and reaps two or three crops a year; more typically, he harvests but one which does little more than feed him and his wife and five children, poorly. The rest of the year he and the land are idle (except for small backyard plots), unless, as the farmer in hilly Batangas province, he uses a few days to root out volcanic rock that has scarred his land for centuries, and so add a few extra square feet of growing soil.

His wife, too, may work in the field, particularly at harvest time, or sell some of their produce at the nearest market. Some wives spend their free time doing piece-work embroidery on material to be sewn into elegant barongs. Others sew garments, working the sewing machine with their knees where there is no electricity; or weave buri (straw-like) hats which they sell in the local market for less than ten U.S. cents apiece. Some few others open a sari-sari store -- a small, one-room operation selling basic bottled, canned, and packaged goods to the neighborhood.

The farm laborer earns his seven to nine pesos a day (currently, $1 = 7.50 pesos) on the sugar estates, or works his hours in the rice fields, the lime quarry, or on the coconut, banana, or pineapple plantation. He may find some narrow space between the edge of the road and the first rows of sugar cane, and here he cultivates a few vegetables for himself and his family. Like the farmer, he frequently has a pig or two, or a goat, which is his bank account, to be sold when money is needed for a child's schooling or for a feast day.

As in most of the Third World, the Philippine rural poor are prey to a number of illnesses and diseases. Infant mortality is relatively high; malaria and schistosomiasis ravage parts of the country. Access to medical care is limited and, for most villages, pure water and sanitation are hopes for the future. Instead of discos or movies, recreation is found on the

basketball court at the local primary (grades 1-4) or elementary (grades 1-6) school, or, sometimes, at the cockpit in the neighboring poblacion (town). At night, the darkness may be softened by a single light in each of the barrio's closely huddled Nipa huts; more likely the spools of electric wire have not yet rolled this way.

Some people live along roads with traffic throughout the year. Most do not. In some areas, a simple dirt trail has been cleared, passable to no vehicle except perhaps that rare jeep whose owner is willing to take the abuse of interminable bumps and undulations. Even this limited hope of access is denied during the rainy season. Then people must take their goods or their sick to town on foot, by horseback, or, frequently, by carabao-pulled sledge. Where existing roads have not been built or maintained properly, the situation is much the same. A few more vehicles may lurch along during the dry season; but when the rains come the cars, tricycles, motorcycles or trucks are nowhere to be found.

If rural residents cannot readily get out, neither do many government services or dealers come in. A midwife, trained in basic medical care, may be living in the community, but frequently is not. If she lives nearby, she is called for in emergencies. Visits by doctors or nurses are infrequent or nonexistent for most rural communities. Agricultural extension agents, or truckers ready to buy the farmer's produce, are seldom to be seen.

The people react accordingly. Where tomatoes or other perishables will spoil before they can get to a market, they will not be grown, and the farmer will have to be satisfied with more robust but less profitable crops. If goods can get to market only with a high cost in time and transportation, the farmer, frustrated also by lack of credit, minimal technical assistance, and other inadequacies of rural infrastructure, will be less likely to incur the extra costs of improved seeds or expensive fertilizers to increase his yield. Farm production stagnates and there is no movement away from bare subsistence agriculture. The social cost is no less severe, as some parents keep their children from school rather than have them endure the mud and rains on foot, or are forced to confront the numberless fevers of infancy with no other recourse than to carry the sick child in their arms as they walk the several kilometers to the nearest medical station.

II. PROJECT DESCRIPTION

The Government of the Philippines attempted to address some of the social and economic problems of rural areas through two programs of road (and related bridge) improvement and construction, supported by A.I.D. loans totalling $39 million. The first (RRP I) was approved in 1974 and the second (RRP II) in 1978. These programs financed a number of projects, in many of the country's provinces,[1/] each of which consisted of the construction or improvement

1/ RRP II also financed roads in certain chartered cities, named Rural Service Centers (RSCs), which served essentially rural areas, and which had demonstrated the capacity to select, plan, and construct rural roads, and the ability to raise local taxes to finance such construction. Construction in these RSCs was a comparatively small part of the program, however, and those few roads completed at the time of this evaluation had not been completed for long. Accordingly, the RSC roads were not included in the evaluation.

of road segments and bridges which formed all or part of a continuous system linking a farm area with a nearby town or market. Three types of roads were identified for inclusion in the program: (a) major feeder roads, which were described as "main access routes to agricultural areas connecting poblaciones and produce collection centers to the primary road network"; (b) minor feeder roads, which served "smaller producing areas and cooperatives" and had lower traffic levels than major feeder roads; and (c) penetration roads, which involved "new construction or improvement of low standard roads or tracks." Where feeder roads existed but were not usable year-round because of inadequate construction or maintenance, the roads and related bridges were to be improved to all-weather standards. Where something like a trail existed, a penetration road was to be constructed and was expected to bring new land under cultivation.

All roads were to be part of the provincial road system, that is, the system for which each province had construction and maintenance responsibility. (This excluded from the programs other road systems in the provinces, which connected with the provincial roads, but for which the national or city governments had responsibility. The national government, for example, has been managing not only the national highway system, but also the Barangay (township) Roads Program, which involves the improvement or construction of single-lane, low-volume roads serving two or more townships. Though many of these roads are connected to provincial roads, which themselves run through other barangays, they have not been part of the provincial road system.)

The goal of these programs was to improve economic and social conditions in rural areas. This would be achieved, it was thought, because (1) agricultural production would be stimulated, by reducing the costs of transporting inputs to the farmer, and produce to the market place, and (2) access to social, educational, and recreational activities would be improved.

There was another goal as well, one which caused the programs to be structured in a special way. For some years, the A.I.D. Mission had been supporting attempts to develop the capacity and authority of provincial governments -- an effort to decentralize some of the power in what traditionally had been a highly centralized governmental structure. There had been considerable progress by 1974. In each of 14 of the country's 73 provinces, a Provincial Development Staff (PDS) had been created, with responsibilities for planning and performing socioeconomic analyses. More importantly, a Provincial Engineering Office (PEO) had also been created, with supporting equipment, motor pools, and soils laboratories for carrying out the province's infrastructure activities. These entities had begun their operations with earlier infrastructure programs supported by A.I.D. Now, under the rural roads programs, their responsibilities, and the number of affected provinces, were to be expanded, the objective being to develop the provinces' capacity to plan and administer programs for the construction of rural roads and other infrastructure.

A key premise of RRP I and RRP II, then, was that responsibility for road selection and construction was to be placed on the participating province. Certain program requirements would help assure the rationality and quality of the province's decisions and actions:

1. To participate in the program a province had to have prepared a Socio-Economic Profile, a five-year Capital Improvement Program (CIP), and an Annual Implementation Plan (AIP), all of which were reviewed by the central government and A.I.D.;

2. The province would make its selection of roads for inclusion in the program on the basis of feasibility studies completed in accordance with prescribed formats for the various roads identified in the infrastructure plan, and rankings would be made on the basis of the resulting Internal Rates of Return (IRR);

3. Social objectives would be maximized by excluding from the program any roads in the large sugar plantation areas, and by limiting roads to areas having at least 10 farms of three hectares or less for each kilometer of road to be improved or constructed;

4. Each road included in the program was to be constructed or improved in annual phases. While the entire road might take three years to construct, the segment approved for inclusion in the program during a given year would be limited to what the province was deemed capable of completing during a twelve-month period. Inclusion of subsequent phases in the succeeding years' programs would be dependent on funding availability and, more importantly, the adequacy of the province's performance in carrying out the previous year's program;

5. Construction would follow detailed design standards developed by the central government and A.I.D.;

6. To assure against inefficiency, or worse, resulting in shoddy construction or unnecessarily high costs, the province would have to improve or construct each road with its own funds, except for a modest "seeding" by the central government. Reimbursement by the central government (and, in turn, A.I.D.) would be limited to no more than 75 percent of the originally approved cost estimate, and would be made only after final inspection and approval of construction by an independent engineer (the Fixed Amount Reimbursement, or "FAR" method); and

7. The province would covenant with the central government to maintain adequately any road or bridge constructed or improved under the program, and the central government would transfer funds to the province, on the basis of an annual maintenance plan, to cover part of the anticipated maintenance costs.

Through the experience gained in these projects -- including a further requirement that the province conduct subsequent evaluations on several selected roads -- and from the resources anticipated to accrue to provinces from, among other things, expected increases in real property taxes, it was expected that each participating province would emerge from the program with a competent PDS and PEO, and with the technical and financial capability to continue on its own, an expanding program of infrastructure activities developed in accordance with sound planning and analytical procedures, and well constructed and maintained.

At the initiation of RRP I, it was estimated that 750 kilometers of roads and 2,400 linear meters of bridges would be constructed or improved. In fact, when the program was finished some four years later, it was found that there were fewer roads (406 kilometers) and more bridges (4,233 linear meters). For RRP II, original projections were approximately 645 kilometers of roads and 6,100 linear meters of bridges. Through calendar year 1979, approximately 388 kilometers of roads and 3,040 linear meters of bridges had been constructed. These variations are not surprising since, by the nature of the project design, the original estimates were less firm than in the typical capital project.

Most of the road construction or improvement has been by force account (i.e., undertaken with the provincial governments' own equipment and employees), while most bridges have been built under contract. Recently, however, provinces have been encouraged (with mixed results) to do more road construction by contract, thereby freeing their own equipment for maintenance work. For the force account work, unskilled labor was invariably obtained from communities near the road. Because of widespread underemployment in the countryside, the labor supply was more than sufficient at all times of the year. The quality of the construction work itself, whether by force account or by contract, with skilled and unskilled labor, was invariably good.

With the exception of construction labor, there was essentially no local community involvement in the planning, construction, and maintenance of the roads. Rather, many people perceived road construction and maintenance as something "the government does" for them.

III. PROJECT IMPACT

The roads encompassed within RRP I and II were varied in many ways. Some were improvements of existing major or minor feeder roads; others were newly constructed penetration roads where nothing but a slim trail existed before. Some were a few kilometers in length; others extended for more than 10 kilometers. Surfaces were sometimes gravel, sometimes concrete or asphalt. Daily traffic counts varied from fewer than 100 vehicles to more than 400. Some roads were in hilly country, others in the lowlands. The surrounding "influence areas" of the roads differed as to crops, irrigation, electrification, and ethnicity, to name but a few variables. More significantly, since the road selection decisions were made by 22 different provinces in RRP I, and 49 (as of April 1, 1980) in RRP II, the quality of these decisions varied greatly, even within the criteria established by the programs. As a result, the impacts were often quite different. Our team visited nine road sites -- five in provinces of Luzon (Cagayan, Zambales, Batangas, Sorsogon, and Bulacan), two in Mindanao (South Cotabato, Davao del Norte) and two in the Visayas (Leyte, Negros Occidental). These sites reflected almost all of the variations cited above. (They also reflected the fact that distinctions between major feeder, minor feeder, and penetration roads were sometimes rather arbitrary. A road at one site classified as major feeder, for example, was difficult to distinguish from a so-called penetration road at a different site. The criteria for each type of road were far from precise.)

In Leyte the road project consisted essentially of putting a concrete surface on an existing, gravel-surfaced major feeder road which, judging from

reports by knowledgeable provincial officials, had previously been in reasonably good condition and had been passable throughout the year. Not surprisingly, the road improvement had almost no impact, except perhaps a modest increase in traffic which appears to result from any type of road activity per se; a very small reduction in vehicle operating costs; and a psychological impact on some people, like one barrio captain who opined that the road improvement symbolized "development and progress."

At the other extreme is a partially completed penetration road in the province of Sorsogon replacing a trail which was barely passable in the dry season and not at all during the rains. Here, the impact has been dramatic. Where before only an occasional hardy jeep entered, there is now regular daily service by jeepney-like mini-buses, and while the as yet unimproved part of the trail is still impassable during the rainy season, the increased dry season jeep traffic on the improved portion has already extended to the full length of the trail. As a result, women who weave straw-like hats from buri, and who previously sold them at 0.15 pesos/hat to buyers who occasionally came to their village by boat, now sell them to more frequent and numerous buyers at 0.30 pesos/hat or, when they bring them to the nearest town, at 0.45 pesos/hat. Some farmers who before could not pay for fertilizer at the high, transportation-inflated cost of 8-10 pesos/sack, are now anxious to buy at 2-2.50 pesos/sack. Crops like bananas, cassava, and vegetables, previously grown for home consumption only, can more readily be sold either to the increased number of buyers regularly arriving or at the nearby town. As a result, a number of farmers are growing more crops or raising more livestock; homes are being built or improved with materials that could not readily be brought in before; farmers are now shipping palay (unhusked rice) to town for milling instead of pounding it themselves; coconuts are now transportable to markets by jeeps rather than by carabao or infrequent boats as before.

More sari-sari stores have opened, as soft-drink and other dealers come in now to offer goods. The agricultural extension agent visits more frequently, as do public health officials, and visits to the local town for medical attention and marketing have increased substantially. One farmer, an enterprising dreamer, reported a more unusual impact. He read in a magazine brought in by one of the newly available jeeps that cassava was a good source of alcohol. Now he is growing more cassava under his coconut trees, hopes to sell his increased yield to a gasohol project, and someday "make it big."

The other sites demonstrated impacts which fell somewhere within these extremes. A rather consistent pattern of activities, however, was observed. When road activity started -- no matter what the type of activity -- some of the more enterprising members of the community sensed an opportunity for making money. Typically, a few of them sold some livestock or obtained credit to purchase a (usually second-hand) tricycle, or, less frequently, a jeep. These people offered services on a regular basis, and at government-regulated rates, between the communities along the road and the market town or junction from which the road construction extended. They also offered their vehicle for transportation to more distant points on a negotiated-rate contractual basis. Business was invariably good and loans were being paid off in a few years, though over time increased competition from other transport operators has eroded their initial advantage in some cases. While these entrepreneurs were some of the major beneficiaries of the road projects, their services in turn had a major impact which accrued to other members of the communities.

A. Economic Impact

As explained in detail in Appendix B, the economic impact of rural roads is complex and difficult to separate from the effects of other rural development activities undertaken at the same time as road construction. Quantification of these effects was not possible because we lacked the time to interview a large number of randomly selected farmers and other persons knowledgeable about rural development activities and local social and political conditions. Thus our judgments about the economic impact of the RRP are qualitative, though we believe they accurately reflect directions of change and rough orders of magnitude.

1. Access and Marketing Benefits

The great majority of rural residents we interviewed claimed to have benefited from road construction, if only because it provided easier, less time-consuming access to places visited for business or leisure purposes. Even when cash outlays for transportation increased (after factoring out the effects of higher fuel prices) -- i.e., when people paid for rides in tricycles or jeeps instead of walking -- the benefits of improved access were perceived as greater than the additional cash costs. Those who derived little or no benefit from road construction were persons living several kilometers from the road and lacking a connecting, all-weather barangay road or trail into their community.

Road construction or improvement almost always increased competition among vehicle drivers and brought more buyers -- offering higher prices for farm products -- into the barangays served by the road. In addition, more people found it attractive to market their products directly, and for the first time they were able to do so during the rainy season. The fragmentary data obtained on the magnitude of the benefits of increased competition, however, suggest that they have been modest. We found few, if any, cases of spectacular declines in transport rates (adjusted for fuel price increases), and often the adjusted rates appeared to be no lower than those charged before the road was improved. Exploitation of farmers by intermediaries does not seem to have been a serious problem in the past; with a few exceptions, the field data we obtained suggest that producers made only small gains as a result of greater competition among buyers.

There were other economic benefits to farmers, however, which should not be neglected. Year-round access to markets on all-weather roads enabled many farmers to sell their rice, corn, fruits, and vegetables before spoilage occurred, especially during the rainy season. Greater contacts with markets also provided farmers with better price information, thus enabling them to make more advantageous decisions regarding the timing and marketing outlet for their sales. Improved roads permitted some farmers to switch into the production of high-value fruits and vegetables whose perishability limits market opportunities when roads are in poor condition and impassable after heavy rains. The extent to which farmers increased fruit and vegetable production as a result of the RRP was difficult to determine. While there were some cases where this clearly occurred (notably in Batangas, Sorsogon, and Zambales), on the whole there appears to have been less of a shift than we expected to find.

2. Negative Effects

The negative economic effects of road construction were of relatively minor importance. We found no evidence of significant environmental deterioration: drainage systems appeared to be adequate to good, and since most of the roads we visited were on flat land there was little danger of hillside erosion. There were some complaints, however, about the increased traffic moving at faster speeds. Also, a number of farmers along the roads reported that they were not compensated for the loss of fruit trees and agricultural land when the provincial governments acquired part of their land for the road right-of-way. Narrower roads, desirable for other reasons explained below, would have resulted in less of a loss of productive capacity.

3. Distributional Considerations

The New Directions Mandate of 1973 makes it important that A.I.D. be concerned not only with the magnitude of project benefits and costs but also with their distribution. The project papers for RRP I and RRP II were both concerned about the impact of road construction on small farmers; but since their major objective was institution building, less attention was paid to the distribution of project benefits than would have been desirable. The statement in the project paper for RRP I that the site selection criteria "preclude the possibility of this project financing rural roads for the benefit of large farms, such as sugar cane plantations," is simply not accurate. The principal criterion relating to small farmers is that "any road to be developed must have an average of ten farms of three hectares or less within its influence area per kilometer." It is easy to define the "influence area" in such a way that the small-farmer criterion is met even though an area is dominated by large farms.

In two of the sites we visited, the beneficiaries of the roads did in fact include large sugar plantation owners. In one of these cases, the road provided clear production benefits, since most of the land brought into sugar cane had previously been idle or used for grazing. There were also definite part-time and seasonal employment gains for poor rural residents (a high proportion of whom were women) who were seasonally underemployed because they lacked the irrigation necessary to grow two rice crops a year. On the other hand, all sugar cane producers were what we would call medium- or large-scale operators (the smallest was reported to have 4 hectares; many had considerably more). Also, it was widely acknowledged that as much as a third of the sugar cane land (an estimate provided by a large sugar cane grower) had previously been used to grow rice. This led us to question whether any tenant rice farmers had been evicted as land use changed. While we found no evidence that this had happened, we had insufficient time to fully investigate this issue, and the question must remain open. Finally, it should be pointed out that employment on sugar cane plantations (at current daily wage rates of US $0.93-1.20) may provide short-run benefits to poor rural families but does little to give them the means to achieve a secure and sustained increase in their living standards.

In one area with very great potential, RRP project, together with an irrigation project scheduled for completion in 1983, is stimulating production increases on existing farm land, and land now in forests is being cleared.

But the land tenure situation is uncertain, and even settlers who have been on their land for several decades have been threatened with eviction. Particularly disturbing is the situation in an area of some 800 hectares, part of which the provincial government is developing as its Palayan ng Bayan project (to meet the legal requirement that some land be set aside by each provincial government to grow rice for its employees, who would buy the rice at subsidized prices), and part of which it is leasing on favorable terms to a private firm with more than 500 employees (which has a similar legal requirement). The lessee has not yet begun production because much of its land, and the adjacent land reserved for the provincial government's own project, is occupied by perhaps several hundred families already growing rice and other crops. Some of these families are recent arrivals with only a tenuous claim to the land, but others have been there since the late 1930s, and land for such projects is supposed to be both public and uncultivated. The tenure situation is unclear because this area, unlike other colonization areas, was never declared a resettlement area, which would have enabled farmers to obtain clear titles to 12-hectare parcels.

The Palayan ng Bayan projects may be viewed as subsidy schemes for the middle and upper classes, and it is questionable that A.I.D.-assisted roads should be built in areas where they are in operation or are contemplated (as was the case with two of the RRP projects we visited). The presence of these schemes and of medium- and large-scale plantations, in a high proportion of the sites we visited, makes it clear that more precise criteria should have been developed to ensure that most of the RRP benefits would go to small farmers.

The beneficiaries of the Rural Roads Program have included not only large and small farmers (and in some cases fishermen), but also transport operators, storeowners, and other persons involved in commercial activities. In some cases, it appeared that road construction -- and the increased production and passenger traffic it stimulated -- benefited the commercial sector more than the small-farm sector, though our evidence here is highly impressionistic. While most of the beneficiaries in the commercial sector were small-scale operators, for the most part they could not have been considered poor prior to the initiation of the RRP.

The RRP appears to have stimulated only a modest amount of off-farm employment activity apart from the small-scale entrepreneurial opportunities created in the commercial sector for those with enough resources to open a sari-sari store, buy a tricycle, or expand an existing enterprise. There was no evidence, for example, of any new agro-industrial activity other than sugar refining and rice and corn milling. During the road construction period, local labor at the sites we visited was hired only for unskilled work on bridges and culverts; the numbers hired were modest and the work of short duration. Sugar cane plantations, as we noted above, provided some new jobs in an area where expansion of the industry was facilitated to some degree by an RRP project; but these were relatively low-paying, part-time and/or seasonal jobs. In another RRP location, close to Manila, there was an increase in the number of women sewing clothes for firms in the metropolitan area; but this may have been due less to the road improvements than to a more reliable electricity supply which apparently stimulated the purchase of electric sewing machines to replace or supplement the manually-operated

machines previously in use. In summary, while economic activity was expanding at all, or almost all, the sites we visited, much of the expansion was due to electrification, irrigation, and other factors besides (and often unrelated to) road improvements. Relatively few off-farm opportunities were created for those most in need of additional employment.

B. Social Services and Infrastructure

1. Education

In nearly every barangay (also called barrio) visited by the team, many of which were small and inaccessible, there was a school which had been there long before the road project. Most of these were primary schools (grades 1-4), though some barangays had elementary schools (grades 1-6) and a very few also had a high school. In no case had any school been constructed, established, modernized or expanded as a consequence of the road project. Nor could any qualitative improvements be identified. Teachers are now as good or bad, and in as ready or short supply as they had been before. Teaching materials continue to be inadequate. It would appear that the widespread presence of schools responded to a Philippine imperative of education for their children, which no degree of inaccessibility could thwart, and which improved access, therefore, affected only slightly.

Some parents reported that their children now go to school more frequently during the rainy season, whereas previously they were kept home when the rains and mud were heavy. But for other parents, like an alert sari-sari store owner who had recently branched out into the transportation business with a second-hand tricycle, the rain and mud were surmountable difficulties, and their children went to school before; now, however, they go in somewhat more comfort.

The roads have changed some schooling logistics. In at least one case attendance at a high school along the road had increased substantially because it now is more convenient and accessible to a number of students than was the high school they previously attended. In another area, several people reported that their children now commute daily to the high school in a neighboring barrio, whereas before the road was improved they boarded during the week with a family in the high school barrio. We could detect, however, no significant increases in school enrollment resulting from the road project.

2. Health

The public health system in the rural areas of the Philippines is based upon the barrio Health Station and the town Rural Health Unit. The former is manned by a midwife who has received brief training in very basic health care. While located in one particular barrio, the midwife radiates to approximately four others. The Rural Health Unit, found in almost all towns, is in the charge of a doctor or nurse. Members of these units are supposed to visit and service the neighboring barrios, but the creation of the Health Station system was to some extent a reflection of the fact that the Health Unit outreach system was not working satisfactorily.

The sites visited by the team were rather typical with respect to coverage by the health system. Prior to the road projects, the Health Stations and Health Units in these areas offered varying degrees of service. The midwives made their visits, but the doctor or nurse was seen rarely (once or twice a year in some places; never in others). The improved access provided by the road construction does not appear to have had a major effect on the quality of midwife service. Midwives travel more easily now, and can be summoned more quickly, but rarely did someone report a significant change in the frequency of their visits. In many areas, however, the road had a significant impact on the frequency of visits by doctors or nurses. In the most extreme case, one barrio reported that a health team which visited once a year before the road construction, now visits every month. Most reports showed less dramatic increases.

The most significant health impact, however, was the quicker and better access now afforded barrio residents to doctors, clinics, and hospitals in the neighboring towns and beyond. Without exception, residents in every barrio identified this as a major road impact. While not knowing how frequently the residents have utilized and benefited from the improved access, we were convinced that the mere fact of such access was sufficient and terribly important for them.

3. Rural Infrastructure and Agricultural Extension

The Philippine Government has a number of rural development programs, such as those providing agricultural extension, rural electrification, community water supplies, and irrigation. But in the areas we visited, with one possible exception, they were not integrated or coordinated with the road programs. Irrigation or electricity, where present at road sites, in most cases predated the road construction, and those instances of contemporaneous or later installation were by happenstance rather than design.

The number of agricultural extensionists in the road project areas has not noticeably increased, and visits by these agents to roadside barrios are usually infrequent. In a few cases, however, extension activities do appear to have increased. At one site, farmers reported increased attendance at seminars given by the extensionist in the neighboring town. The road improvement was directly responsible for this. At another site the road facilitated the mobility of extension agents promoting increased cotton production.

In those cases where other governmental services, in addition to roads, had been provided, the interventions seemed mutually reinforcing and the impacts thereby increased. In one rice area, where the road improvement itself had little impact because the previously existing road had been adequate, we found that an irrigation system and a barangay road had been developed in the past several years. Agricultural extensionists working with rice production were in evidence, and a government-operated (NGA) rice warehouse had opened in the nearby town. Farmers can now bring much of their increased rice yield to the warehouse and receive a higher price than that offered by truckers at the farm gate; the NGA will itself send a truck to pick up large quantities. The existence of the all-weather feeder road is an

essential link in this complex of services and activities, and the overall impact indicates what might have been achieved at other sites, had the road project been part of an integrated package of services.

At another site, road construction was accompanied by work on a large-scale irrigation project that will take another three years to complete. These projects are complementary in that the road facilitates the marketing of the increased production that irrigation makes technically possible. Private on-farm investment has been stimulated, and there has been some self-help construction of barangay roads linked to the project road.

4. Perceived Quality of Life

Without exception, people in the affected communities view the road project favorably. Even when they can identify no personal impact, they look at the road as a significant development for their community and one which they regard favorably. They now have enhanced possibilities for visiting towns or cities beyond their barrios, for health, educational, recreational, marketing, or whatever reasons. In some areas, commuting to jobs in nearby urban areas is now feasible, but road construction appears to have had only a small effect on such employment. This increased access, if only psychological, is important, as is the fact that for some people the road project represents "development" or "progress." To the extent that rural residents do use the road for travel to nearby towns, the principal quality-of-life benefits are (1) reduction of travel time, both because of faster vehicle speeds and because less time is spent waiting for transport services; (2) more comfortable rides; and (3) year-round ability to leave their communities by motorized transport for medical and other emergencies.

C. Institutional Impact

In each province where roads were constructed, the Provincial Development Staff (PDS) and the Provincial Engineering Office (PEO) performed a series of required tasks. The PDS prepared socioeconomic profiles of the province, five-year and annual infrastructure implementation plans, and feasibility studies. The PEO accomplished the road construction and some maintenance. While the construction was satisfactory, the quality of other work left much to be desired. Feasibility studies were not of high quality. Some understated expected benefits, but overstatement was common, in one case because the drafter had forgotten to divide by two. In one study, increased rice production was an expected benefit, but our team could find no evidence of rice being grown in the road's influence area. Another study grossly misstated distances between barrios along the road, and thus underestimated by several kilometers the length of road required to reach the barrio furthest from town. While the feasibility studies followed the rather precise required formats, we would not have confidence in the accuracy of the data used, much of which consists of armchair estimates or rule-of-thumb engineering ratios. The same would be true for evaluations, since baseline data were usually taken from the feasibility study or from surveys that were conducted too hastily and failed to ask some important questions. Most provinces are not keeping up-to-date on their evaluation schedules, and some appear not to take this requirement very seriously.

The PEOs, in turn, are not adequately maintaining the roads. Potholes are being filled, often in response to requests from barrios, but no regular maintenance is being performed. At two sites, the anticipation of our team's visit stimulated the first comprehensive maintenance effort since the completion of construction. Vegetation growth is encroaching on a number of roadways so much that some two-lane roads are approaching one-lane travel width. Fortunately, a large percentage of the vehicular traffic consists of tricycles and jeeps, relatively light units for the roadway design standards adopted, and as a result there is little noticeable deterioration of the roadway riding surface.

The maintenance problem is endemic, and certainly not limited to these projects. Provincial engineers construct with concrete or asphalt surfaces where they can, because the maintenance requirements for such roads are considerably less demanding than for gravel surfaces. While considerable (though probably inadequate) funding for maintenance is provided from the central government, it is frequently diverted to other uses. As one provincial engineer explained, each province prepares an annual maintenance plan together with evidence that it has made available from its own resources the prescribed percentage of funds. When the plan has been submitted to the central government and approved, the central government funding is forthcoming. In this particular province, the maintenance funds were utilized for other administrative expenses, and, since the central government looks only at the paperwork of the annual plans, there had been no complaints. This misdirection of maintenance funds did not appear to be venally motivated. It was instead a way to compensate for inadequate provincial financial resources.

With a few notable exceptions, the provinces are having difficulty in attracting and keeping qualified professional staff for the PDS and PEO. Salaries set in accordance with national civil service criteria are low. Qualified professional engineers, in particular, have substantially better options in the private sector, or overseas in Saudi Arabia, and most work but a few years for the PEO. While alternative employment opportunities are not as great for most PDS professionals, there are vacancies in many positions, and the qualifications of some of the personnel are not high. It is very likely that the PDS and PEO staffs have been strengthened through their participation in the RRP, although this is a difficult judgment for us to make. However, it would be fair to say that in the majority of provinces the PDS and PEO staffs have not yet attained desirable levels of professional competence or a reasonable continuity of personnel.

As part of the institution-building effort, it was contemplated that a system for prioritizing road projects would be developed based upon the internal rates of return shown by feasibility studies. In this way, the most economically productive roads would be given the highest priority. Presumably, this system was to be institutionalized to the point that it would be utilized by the provinces in all of their infrastructure programs. In fact, the programs did not develop in this way. Not surprisingly, road selection decisions were made by the respective governors, and their decisions were based more on political than economic considerations, although the criteria established for the project roads, and the requirement for implementation plans and feasibility studies, limited the scope within which such political decisions could be made. In one province, a bureaucratically

savvy Provincial Development Coordinator (the chief of the PDS) was able to limit the scope even more. Knowing that there might be funding for only three road projects, he would have feasibility studies done for the five or six that seemed most important economically. The Governor's selection among these five or six was not always based on the highest rates of return, but at least he was precluded from selecting other, less economically desirable roads. This was an exception, however, and in most provinces the Governor selected the road subject only to a positive feasibility study. No PDS staffer could recall any feasibility study which showed benefit/cost ratios less than 1.00 or internal rates of return below 15 percent.

The institutions strengthened by these road programs, and the procedures followed, were to be the foundation of expanding provincial infrastructure programs, financed in large part by increased real property taxes. Unfortunately, this has not taken place. Real property assessments have recently been raised substantially and this may eventually bring the desired increases in funding, but at present the infrastructure activities of most provinces, with the exception of an occasional market or primary school, are limited to those supported by A.I.D. funding. If that funding diminishes, or ceases, and is not replaced by alternative funding, one cannot be optimistic as to the future of the new institutions and practices. One partial remedy would be to make real property assessments more frequently than every five years or so as in the past. We understand that a decision was made recently to conduct assessments every three years, with more frequent assessments considered undesirable in view of the strains placed on administrative capacity.

Some results of the lack of expansion of provincial infrastructure activities are apparent even now. In response to the requirements established by A.I.D. for these road projects, each province established a complete soils testing laboratory and equipment maintenance shops. Both are very much underutilized. And while certain professional skills are lacking in the PDS and PEO, many existing employees are being underutilized because of the limited amount of ongoing activities. Thus, soils laboratories have three to seven technicians with little to do; and the 30 to 40 mechanics or mechanic helpers on some of the larger PEO staffs often appear to be making work, with no real repair work in progress on the disabled vehicles in the shop. It is clear that the present organizational structures of the PDS and PEO respond more to the requirements established for participating in the road program than to the actual requirements of present activities.

IV. CONCLUSIONS, LESSONS LEARNED AND POLICY IMPLICATIONS

1. If the benefits of rural roads projects are to be concentrated on the rural poor, the criteria for site selection must be more precise than those used in the Philippines. The criteria used did not prevent large and medium-sized farms from receiving considerable benefits from the project, despite the project paper's statement that such benefits would be precluded. Moreover, the selection criteria say nothing about tenure status and possible threats to tenure security that might result from road construction. The project has encouraged agricultural growth, but it has done little to promote more equitable growth.

2. The institution-building objectives of the project included the strengthening of both the engineering and the socioeconomic research capabilities of the provincial governments. These objectives very likely were achieved in part, though desirable levels of PDS and PEO staff competence have not yet been attained. The objective of more decentralized decision-making appears to have been achieved. However, the ultimate goal of establishing competent PEO and PDS staffs in most of the country's 73 provinces imposed a considerable manpower burden on the Philippines, even though the country's human resources are better trained than in most countries at the same level of development. Even with a reasonably active construction program, for example, it would seem difficult to justify a complete soils laboratory in each targeted province. The average population of a province is only about 650,000, and we wonder whether regional rather than provincial institutions might have been more appropriate in an economies-of-scale sense. But perhaps this would have compromised political decentralization objectives.

3. The RRP has a strong engineering bias that emphasizes capital-intensive construction and excludes community-level participation in decision-making. The capital-intensive bias inherent in highway departments throughout the world (Tendler, 1979) was reinforced by the availability under RRP I and RRP II of excess U.S. property at artificially low prices. The issue of capital vs. labor-intensive construction methods for rural roads was hardly considered. If labor-intensive methods are actually more cost-effective in the Philippines than existing methods, then one might argue, a la Tendler, that the institutions supported under RRP I and RRP II were not necessarily the correct institutions. But even if capital-intensive methods were in fact advisable for feeder/penetration roads, as seems likely in many cases, there still seems to be some scope for using labor-intensive methods to improve the barangay roads -- an important component of the rural roads network that has not been well integrated with the RRP because of the institutional division of labor among the different levels of government responsible for road construction. This issue is further discussed in paragraphs 6 and 7 below.

4. The feasibility studies required under the RRP probably have had little effect in determining road construction priorities. It appears that almost all roads pre-selected for inclusion in the Annual Implementation Plans passed the benefit-cost and internal-rate-of-return tests once the feasibility studies were conducted. And to the extent that B/C or IRR criteria were modified to take other considerations into account, the changes seem to have reflected political concerns other than equity. One might conclude from this experience that the feasibility studies are worthless and should not be required; but we would suggest another approach to solving this problem. First, the initial selection criteria for including road projects in the AIPs should give much greater weight to equity concerns. This implies a more detailed socioeconomic analysis at this early stage, with more technical assistance probably required. Second, equity concerns should be incorporated explicitly into the B/C and IRR analysis, e.g., by weighing benefits inversely with the income level of the beneficiaries. This was recommended in a May 1977 evaluation performed by USAID/Philippines, but no action was taken. Third, more technical assistance is needed to improve the quality of the feasibility studies, not only to incorporate equity but also to provide more

realistic estimates of production increases attributable to road construction. Except for the incorporation of equity concerns, the analysis itself need not be more complex.

5. One manifestation of the Program's strong engineering bias has been the adoption of road design standards inappropriate to traffic conditions in the Philippines. Traffic flows on most of the roads we visited were low to moderate, and most of the motorized vehicles were tricycles. Road widths of 6 meters, with one and one-half meter shoulders on each side, are unnecessarily wide. In most cases, a 5-meter width without shoulders is probably adequate, and one-lane bridges would suffice in some cases. It is doubtful that any of the asphalt or concrete paving could be justified. We were informed that USAID/Manila and the GOP have recently agreed to a memorandum of understanding under which lower, more appropriate standards have been accepted for the RRP. A more formal adoption of lower standards would be desirable.

6. The impact of the Rural Roads Program would have been greater had construction or improvement of provincial roads been integrated with improvements to the barangay roads linking more isolated communities with the provincial roads. In other words, a "road system" should be thought of not in linear terms but rather as a network comprising both a feeder or penetration road and the shorter roads fanning out from the feeder or penetration road to nearby barangays. Construction and improvement of the barangay roads, which have been under the jurisdiction of the national government (Ministry of Public Highways, or MPH), have not always been well-coordinated with the development of provincial roads. We were encouraged to learn, however, that responsibility for planning, construction, and maintenance of the barangay roads has recently been transferred from the MPH to the Ministry of Local Government and Community Development (MLGCD), which is responsible for the RRP. If the necessary grants-in-aid for construction and maintenance are forthcoming, this would constitute a significant institutional improvement.

7. There has been very little community involvement in the planning, construction, and maintenance of rural roads. Greater community participation would not only make the RRP more responsive to local residents' interests but also could facilitate the use of labor-intensive construction and maintenance techniques, and possibly, provide the basis for an effective and workable maintenance system.

8. In our judgment, the greatest impacts -- and probably the highest rates of return -- in the RRP have been achieved by the construction of penetration roads which provided access to areas which previously were relatively isolated, and bridges. While the relative importance of bridge construction has in fact been greater than originally anticipated, insufficient emphasis has been given to penetration roads.

9. Road construction and improvement programs, other things equal, will have a greater impact the more they are integrated with other rural development activities. Improved roads, for example, make irrigation projects more cost-effective by providing more and cheaper marketing outlets for the increased production that irrigation makes possible. Thus there is a greater incentive to increase production on irrigated lands than would be the case without road improvements. This symbiotic relationship does not necessarily

mean that integrated rural development program models should be adopted, but at the very least, there should be greater coordination among various government agencies implementing rural development programs.

10. An interesting aspect of the RRP has been its use of the Fixed Amount Reimbursement (FAR) scheme. By requiring provinces to initiate projects with their own resources, to assume full responsibility for cost overruns, and to complete project phases within the time frame of an Annual Implementation Plan, the FAR scheme provides an incentive for efficient and timely construction (though safeguards are needed to prevent cost savings through sacrifices in the quality of construction). The attractiveness of the FAR, however, is offset by its bias in favor of provinces with strong finances. Many of the poorer and less financially healthy provinces have not yet participated in the RRP, or have participated to a lesser extent than desirable, because they have been unable to meet its financial and technical requirements. A modification of the FAR scheme, to permit incremental funding for these provinces, would be desirable.

APPENDIX A

METHODOLOGICAL PROCEDURES AND OBSERVATIONS

A. LOGISTICS AND PROCEDURES

The universe from which we were to select the sites to be visited was initially reported by USAID/Manila to be 43 road systems.[1] Given the nature of the evaluation, site selection by random sampling was inappropriate. Instead, we sought to select projects that were representative of a variety of different situations, as described below. Since the impact of rural roads is complex, we decided to visit only a limited number of sites.

The information available in Washington was not sufficiently detailed to permit a selection of sites prior to departure for the Philippines. We thus concluded that probably a full week in Manila would be necessary to choose the sites, arrange for local transportation and other logistics, brief the Mission on our procedures, visit appropriate national government institutions, and pre-test our questionnaires at an AID-financed rural road

ing in Manila, we discovered that the Mission's list of 43 road sites for which evaluations might be considered was limited to completed or substantially completed road systems only, and that this list had been reduced to 27. Of the 16 projects no longer on the list, 15 had been eliminated because all road sections and bridges in the system had not been completed by the end of 1979. In the other case, maintenance had been so poor that the province was suspended from the program. We were also informed that the original list excluded 26 completed road systems less than 5 kilometers long.[2] After discussing these matters with the Mission, we concluded that the appropriate universe for site selection was 69, i.e., 43 plus 26. While some of the 43 road systems on the initial list had not been completed, it was our judgment that sufficient work had been done for some impact to be discernible. We also felt that the one improperly maintained road and all of the 26 completed short road systems were appropriate candidates for study.

Although the Mission had made a tentative selection of road projects for us to visit, based upon a rating system it had devised, we chose to make our own selection, using the criteria we had selected during our pre-departure discussions in Washington, as modified slightly on the basis of information obtained in Manila. Specifically, we sought to identify sites that would highlight differences in:

[1] See Manila 05891, 03/26/80.

[2] A "road system" consists of various connecting or related road segments and bridges, each of which is to be constructed in a period of no more than one year under an Annual Investment Plan. Some systems are completed in one year, but others may take 3-4 years to finish.

(1) type of road (major feeder, minor feeder, penetration)

(2) length of road;

(3) major crop(s) in the influence area (rice, corn, coconuts, mixed farming);

(4) time of completion (early in program, recent completion, system still under construction);

(5) elevation (including a site in the highlands, where a previous Mission evaluation had discovered a negative impact among an ethnic minority group in one project site);

(6) poverty levels of the province and of the specific areas affected by the individual road systems;

(7) geographic location (Luzon, Visayan Islands, Mindanao);

(8) total amount of project funds allocated to the provinces for road construction;

(9) distance from major markets.

We sought to pick one site which, while reflecting one or more of the differences listed above, also would have been the subject of a prior Mission evaluation. We also introduced one negative criterion, the avoidance of two areas (the Bicol region of Luzon and the island of Panay) in which an unusually large number of A.I.D. evaluation studies had already been conducted.[3] Several other geographic locations (e.g., the islands of Palawan and Mindoro) were eliminated because logistical problems would have caused us to spend an undesirable amount of valuable time traveling between sites.

The evaluation team discussed the possibility of selecting a control site(s), so that project areas could be compared with similar locations where rural roads had not been built or improved. But given the difficulties of selecting appropriate control sites and isolating the effects of road construction in the limited time available to us, as well as the desirability of spending at least two full days on each of eight project sites, we decided not to evaluate any control locations unless quirks in our travel schedules permitted this to be done briefly on an ad hoc basis. This was hardly an ideal arrangement, but given time constraints, some methodological compromises were unavoidable.

[3]Nevertheless, we ultimately selected one site in the Bicol region, specifically in Sorsogon, a poor, remote, and relatively neglected province.

The eight project sites selected for evaluation were as follows:

Road System	Island	Province	Kilometers	Surface
Calaca-Madalunot	Luzon	Batangas	5.0	Gravel
Pawa-Santa Magdalena	Luzon	Sorsogon	1.4[4]	Gravel/Asphalt
Palca Luzon	Cagayan	6.3	Gravel	
Castillejos-Nagbayan	Luzon	Zambales	4.4	Gravel
Jct. Vito-Vito	Negros	Negros Occidental	6.7	Gravel/Concrete
Mainit-San Miguel	Leyte	Leyte	8.0	Concrete
Maltana-Cebuano	Mindanao	South Cotabato	7.8[5]	Gravel
Santo Tomas-San Miguel	Mindanao	Davao del Norte	13.8	Gravel

Additional details on the project sites we visited are provided in Appendix B.

Prior to our arrival in Manila, the three Washington-based members of the Evaluation Team -- a general development officer, an economist, and an engineer -- decided that two field teams would be needed to visit a sufficiently large number of project sites (which we judged to be eight) and to spend enough time (2 days) at each site to collect more than superficial information. It was also imperative that each of the teams include one or more persons able to speak the languages other than English in which interviews would be conducted (Tagalog, Cebuano-Visayan, Bicolano, Ilongo, Waray, and Ilocano). Finally, each field team needed to include an economist, a social scientist, and an engineer. Arrangements were made through USAID/Manila to contract for the services of two social scientists (a Filipina and a U.S. national with 10 years' experience in the Philippines). We also obtained the services of a USDH agricultural economist fluent in Tagalog and three local-hire USAID/Manila professionals (two engineers and an economist). The composition of the two field teams was as follows:

Team I

General Development Officer (AID/W)
Engineer (AID/W retired)
Engineer (USAID/Manila local-hire)
Economist (USAID/Manila local-hire)
Social Scientist (local contractor)

[4]One reason for selecting this site was the road's short length. We discovered, however, that 4.0 additional kilometers had been constructed under the RRP, and 2.5 kilometers under the SIP, and so examined the influence area of these additional segments as well.

[5]The 7.8 kilometers figure includes 3.0 kilometers separated from the Maltana-Cebuano segment by a stretch of unimproved road. We evaluated only the 4.8 kilometer segment between Maltana and Cebuano.

Team II

Economist (AID/W)
Engineer (USAID/Manila local-hire)
Agricultural Economist (USAID/Manila USDH)
Social Scientist (U.S. National contractor)

We were somewhat concerned about the size of the field teams, particularly for interviewing farmers; but to obtain the desired technical and linguistic capabilities four persons per team were needed. Also, the addition of a local-hire engineer to Team I was deemed desirable in order to facilitate liaison with the provincial governments. In any event, usually only 2-3 team members, and sometimes just one, were present at any given interview, except for the initial interviews/briefings with the Provincial Engineering Offices and Provincial Development Staffs. The size of our field teams sometimes even proved to be an advantage. Since most of the Filipino professionals we wished to interview were fluent in English, the field teams were able to subdivide and thus conduct as many as three simultaneous interviews.

One of the more difficult methodological problems we had to face was the presence of provincial government staff members during our interviews with barrio captains, farmers, fishermen, transport operators, business proprietors, and officials of other government agencies (e.g., extension services, banks, and agrarian reform offices). On the one hand, the excellent logistical support provided by the PEOs and PDSs enabled us to interview more persons than would have been possible had we made our own logistical arrangements. In addition, provincial government officials sometimes provided valuable interviewing and translating assistance. On the other hand, the presence of these officials sometimes acted as an inhibiting factor, particularly with farmers. Also, we occasionally perceived that attempts were made to influence our choice of interviewees. Fortu- nately, members of the field teams were sometimes able to wander off to seek interviewees by themselves.

In collecting data for each project site, the evaluation team used a number of forms and questionnaires. First drafts were written in Washington and revised after discussions with all team members in Manila. Further revisions were made following the pretest of our questionnaires on the site of the Pandi-Angat road in Bulacan province, about one-hour's drive from Manila. While we recognized that the questionnaires for farmers and barrio captains were too long to hope for complete answers to all questions, we felt that the preparation of detailed questionnaires was a valuable exercise in that it raised a number of important issues and avenues of investigation that we did not originally perceive. In addition, a written questionnaire, if filled out in English at the time of the interview, would enable those of use who did not speak any of the local languages to ask follow-up questions

that could clarify ambiguous answers or pursue a promising field of investigation in more detail.[6]

One of the consequences of our field test was to lead us to give more emphasis to interviews with barrio captains than we had originally intended -- a decision from which we subsequently backtracked to some extent. One advantage of these interviews with the heads of the country's smallest political units was that the barrio captains usually have a better overview of conditions in their communities than other residents. During the course of our field studies, however, it became evident that some barrio captains were more representative of the provincial/national power structure than of the communities they represented. This appears to be due to the absence of barrio captain elections since 1972, and consequently the increased percentage of barrio captains who are appointed. Also, while many barrio captains were well-informed and articulate, others had difficulty in responding to questions. While interviews with some barrio captains were unavoidable and still desirable and while some proved highly informative, we eventually decided that these were not an adequate substitute for interviews with as many farmers (and fishermen) as time permitted.

Our interviews with farmers (and fishermen) were usually individual interviews, though group interviews were also obtained. The latter were sometimes accidental: on several occasions, interviews with store operators were transformed into group interviews as curious local residents crowded around the store to see who the visitors were and what they wanted. Given the short time available to us, there were probably some advantages to the group interview procedure. On the other hand, the presence in some groups of certain individuals (e.g., the mother of a barrio captain) probably inhibited discussion. Also, some discrepancies sometimes arose during group discussions (e.g., with respect to transport rates), and these were difficult to resolve in this format.

The evaluation team prepared interview forms not only for farmers and barrio captains but also for transport operators and proprietors of commercial establishments (chiefly sari-sari stores, small establishments that sell beer and soft drinks, canned goods, snacks, and basic household items). In addition, we interviewed fishermen, agricultural extension agents, school teachers, midwives, rural health officials, officials of the Ministry of Agrarian Reform, provincial assessors, bankers, middlemen, municipal officials, market vendors, and one Peace Corps volunteer. No interview forms were prepared for these respondents, but they sometimes provided valuable information relating to the impact of rural roads on local communities.

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[6] In fact, most of the interviews were not recorded directly on the forms. Nevertheless, the questionnaire was still a useful reference: since the local languages are peppered with both English and Spanish words, the Washington-based members of the team were sometimes able to discern what questions were being asked and whether the responses were complete. Where this was not possible, the interview was interrupted while the answer was translated verbally.

Given the strong emphasis in the project papers on the institution-building aspects of the Rural Roads Program, we prepared several forms to evaluate the impact of the project on the Provincial Engineering Offices and the Provincial Development Staffs as development institutions. To obtain the necessary information, and to meet protocol obligations with these institutions, took an average of one half day.

B. OBSERVATIONS

It was evident before we went to the field that insufficient time was available to provide any reliable benefit-cost measure of the impact of the Rural Roads Program on the target population. While construction cost data could be obtained, quantifying project benefits is a complex task. To obtain reliable estimates of transport cost savings requires a more sophisticated traffic count -- measuring seasonal variations as well as variations within the week -- than the one- or two-day counts we conducted.[7] A detailed examination of maintenance records would be needed to determine actual (as opposed to estimated) maintenance costs before and after construction. In measuring transport and maintenance cost savings, the effects of sharp increases in the price of petroleum products must be factored out. Another problem was that we had insufficient time to reconcile the conflicting information we often received on transport rates.

The greater difficulties, however, are those surrounding the measurement of incremental production attributable to the road projects. In the feasibility studies we reviewed, incremental production generally accounted for the great bulk of the anticipated benefits. To measure actual incremental production benefits accurately, gaps in the baseline data would have to be filled, and available baseline data would have to be verified. Data on production increases since the beginning of the RRP are nonexistent for some areas and crops, and a large number of farmers, extension agents, buying agents, and other individuals would have to be interviewed to obtain reasonably good estimates. Once these data were obtained, the effects of road construction would have to be separated from those of other activities (e.g., extension, credit, irrigation) that would have taken place or did take place, regardless of road construction. Such factors as changes in price and marketing policies, as well as the sharp decline in world copra prices, would also have to be taken into account. This requires a detailed investigation of other agricultural development activities.

Also difficult to quantify are the so-called non-economic benefits (e.g., improved health and education services, more equitable income distribution) that might be attributable to road construction. Indeed, the tendency in the Philippines -- as in most other countries -- is to refer to

[7] The baseline traffic counts, while covering a longer period than our counts, also failed to account for seasonal variations. Our own traffic counts were nevertheless valuable for providing a rough indication of traffic flows and for revealing that tricycles constituted a very high proportion of the total traffic.

these benefits as "unquantifiable," which in effect assigns them a value of zero. But if we are serious about the importance of these benefits as project outputs, some efforts at quantification are desirable. Again, this is a time-consuming task, and benefits attributable to road construction must be separated from those that would have been received because of other, independently-undertaken programs.

What all this means, of course, is that impact evaluations of the type we conducted must rely primarily on qualitative measures of change based on informed judgment. This judgment must take into account the effects of road construction not only on transport and maintenance costs, increased production, and social services, but also on socioeconomic changes such as land-sale transactions, eviction of tenants, and other factors affecting the distribution of benefits among the various income groups in the influence area of any given road. In our short site visits, we were able to identify some socioeconomic changes of this nature, but in two days one can only scratch the surface of this most important area of investigation. It takes much more time to understand local social and political forces and how they interact with provincial and national forces, even if the evaluation team includes anthropologists who have done fieldwork in the evaluation areas -- a recommendation by Devres, Inc. (1980) with which we concur.

SUMMARY OF INTERVIEWS

Road	Province	Gov'nrs or Lt. Gov'nrs	Provincial Development Staffs	Provincial Engineering Offices	Barrio Capt. & Members	Individual Farmers	Transport Operators	Store Operators	Other Individuals[2]	Groups Meetings & Interviews
Pandi-Angat[1]	Bulacan	-	x	x	1	2	0	0	2	0
Calaca-Madalunot	Batangas	x	x	x	2	5	4	2	6	0
Pawa-Sta. Magdalena	Sorsogon	x	x	x	2	4	4	4	7	1
Palca	Cagayan	x	x	x	4	0	0	6	4	6
Castillejos-Nagbayan	Zambales	-	x	x	2	6	1	1	3	1
Jct. Vito-Vito	Negros Occid.	-	x	x	1	5	6	4	4	2
Mainit-San Miguel	Leyte	-	x	x	3	4	5	0	4	0
Maltana Cabuano	South Cotabato	x	x	x	2	7	3	2	4	1
San Miguel-Santo Tomas	Davao del Norte	x	x	x	1	5	3	3	7	2
TOTALS		5	9	9	18	38	26	22	41	13

1/ Pre-test site.

2/ Includes bankers, provincial assessors, extension agents, agrarian reform officials, town mayors, cottage industry workers, teachers, midwives, private sector representatives.

APPENDIX B

PROJECT SITE PROFILES

PROJECT SITE CHARACTERISTICS

Road	Island	Province	Median Rural Family Income of Province, 1971 Pesos	Rank	Type of Road	Length (kms.)	Terrain	Surface	Construction Period[2/]	Proximity to Large Market Area[3/]	Major Agricultural Products
Pandi-Angat[1/]	Luzon	Bulacan	2,644	19	Major Feeder	9.8	Flat to hilly	Gravel[7/]	1976	Close	Rice Poultry Vegetables
Calaca-Madalunot	Luzon	Batangas	1,982	27	Penetration	5.0	Rolling	Gravel	1977-78	Distant	Rice Coconuts Bananas Vegetables
Pawa-Sta. Magdalena - Talaonga[5/]	Luzon	Sorsogon	1,381	49	Penetration	7.9[5/]	Flat to hilly	Gravel[9/]	1977-79[10/]	Distant	Coconuts Rice
Palca	Luzon	Cagayan	1,468	42	Major Feeder	6.3	Flat to rolling	Gravel	1977-78[8/]	Distant	Rice Corn Sugar cane
Castillejos-Nagbayan	Luzon	Zambales	3,712	8	Major/ Minor Feeder[4/]	4.4	Flat	Gravel	1976	Close	Rice Corn Watermelons
Jct. Vito-Vito	Negros	Negros Occid.	2,662	18	Major Feeder	6.7	Mostly flat to slightly rolling	Gravel/ Concrete	1978	Distant	Sugar cane Fish Coconuts
Mainit-San Miguel	Leyte	Leyte	1,207	55	Major Feeder	8.0	Flat	Concrete	1976-77[8/]	Distant	Rice Coconuts
Maltana-Cebuano	Mindanao	South Cotabato	2,693	17	Major Feeder	4.8[6/]	Mostly flat	Gravel	1976	Close	Corn Coconuts Rice
San Miguel-Santo Tomas	Mindanao	Davao del Norte	2,293	25	Minor Feeder	13.8	Flat	Gravel	1977-79	Close	Rice, Corn Coconuts Bananas

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NOTES TO PROJECT SITE CHARACTERISTICS

1/Field-test site.

2/Annual Implementation Plan (AIP) Years.

3/Within an hour or so of major urban areas such as Manila, Cebu, Davao, Iloilo, Olongopo City, and General Santos City.

4/Documentation not consistent and often arbitrary.

5/In RRP project documents, this was listed as the Pawa-Sta. Magdalena road of 1.4 kilometers. However, 2.5 kilometers had previously been improved under the Special Infrastructure Program (SIP) which immediately preceeded the RRP. (The entire road from Pawa to Sta. Magdalena totalled 9.1 kilometers, 5.2 kilometers of which were not included in any A.I.D.-financed program.) Also, the province's feasibility study included the Sta. Magdalena-Talaonga segment of nine kilometers in the project, and even though the latter had been only partially completed (four kilometers), it was included in the evaluation. Segments totalling 7.9 kilometers, then, have been improved to date, under A.I.D.-financed programs, and are included in the table.

6/Listed as 7.8 kilometers in RRP project documents, but the segment between Maltana and Cebuano is actually 4.8 kilometers.

7/Now being paved under the RRP.

8/Parts of these roads were constructed under the SIP. The SIP segments are included in the table.

9/While 1.4 kilometer Pawa-Sta. Magdalena segment was constructed with gravel surface under RRP, the province subsequently, with its own resources, asphalted 800 meters.

10/Balance of Sta. Magdalena-Talaonga segment may be constructed in the future.

PANDI-ANGAT ROAD

The Pandi-Angat road, classified as a major feeder road, is located in the municipalities of Pandi and Angat in Bulucan province. The area is less than an hour from metropolitan Manila, where most of the area's agricultural output is marketed, either directly or indirectly through nearby markets such as those in Santa Maria and Guiguinto.

The contribution of the road project to economic activity in the area has probably been modest. Even before the road was improved, many buyers would come into the area during the dry season. And in the rainy season, when jeeps could not get through, farmers would take their produce to market on sledges pulled by carabao. On the other hand, there were some unforeseen benefits of an indeterminate magnitude -- e.g., transport savings by trucks and other vehicles using the road as a short cut between Manila and more distant locations. We were also told that the road is used on weekends by Manila residents traveling to nearby sites.

The project was begun in Octobr 1976 and completed in March 1977. The road is in good condition and appears to be maintained regularly. At present, and also under the RRP, four kilometers of the road, starting from Pandi, are being prepared for paving with an asphalt surface. It is difficult to see how this paving can be justified, especially since the relatively low estimated internal rate of return of 16 percent is based on an overstated traffic count and unduly optimistic assumptions about production increases.

The economic base of the area is quite diversified and includes handicraft and cottage industry production as well as agriculture. Major crops include rice (unirrigated), eggplant, string beans, and yams. Poultry, swine, and cattle are also raised. The broiler industry is especially important and is visibly expanding, especially at the Pandi end of the road, which will soon be paved. While farmers of all sizes are engaged in commercial broiler production, medium- and large-scale operations seem to be dominant. Another beneficiary of the road is a corporation that is promoting a multipurpose project on 14 hectares recently purchased from private landowners who had been exempt from agrarian reform provisions because they farmed the land directly, without tenants. The new project, according to the promotional sign along the road, will include fish ponds, commerical rice production, weekend homes, vegetables, poultry and piggery operations, and agribusiness enterprises.

Residents report that there is considerable seasonal unemployment in the area because the lack of irrigation water permits only one rice crop per year. Some farmers or members of their families, however, probably obtain seasonal employment in the Metro Manila area, though we had insufficient time to investigate how important this might be. A number of women do sewing for clothing firms in Manila, an activity that predated the improvement of the road. This activity has increased in the last few years, not because of the road but because of improvements to the local electric power system which stimulated the purchase of more electric sewing machines (though some manually-operated machines are still used).

Two tenant farmers reported that their greatest need was irrigation water. But they said that there is no groundwater in the area and that the nearest river was at Angat, about six kilometers away over hilly country. Thus, it is doubtful that an irrigation project affecting their lands could be economically justified.

CALACA-MADALUNOT

The Calaca-Madalunot road runs for approximately five kilometers from the poblacion of Calaca to the barrio of Madalunot. It is a penetration road in rolling terrain, constructed with a gravel surface. Phase I, totalling two and one-half kilometers, started in mid-1977 and was finished in early 1978. The second half of the improvement took place in calendar year 1978.

The influence area of the road is characterized primarily by farmers with 1-2 hectares of land. There is no electricity, except in Calaca, and no irrigation in the area. Rice is the major crop; coconuts and bananas follow in that order. Some corn and vegetables are grown, including tomatoes which appear to have increased in production since the road improvement. Many farmers have one or two livestock, usually cattle (some pigs), on their land. While previous access to this area was usually by horseback or on foot, tricycles and jeeps are now in evidence, though not in great numbers.

At approximately 3-4 kilometers beyond Madalunot lies the barrio of Matipoc; Tamayo is two kilometers further. While the road improvement does not extend to these barrios, it appears to have had an indirect impact on them. Shortly after the Calaca-Madalunot road was completed, the national government sent in a road grader which leveled the then-existing trail running from the end of our road to a point near Tamayo, thus opening up this strip to motor vehicle traffic during the dry season. Interestingly enough, the evidence of economic and social impact is more apparent at Matipoc than at Madalunot. There is some evidence of increased agricultural production, attributable to improved access to such items as fertilizer and agricultural extension information provided by the road. This is particularly true with respect to coconut and tomato production. Some people have increased their pig stock because pig feed is now more easily obtained from the poblacion. In a number of areas, the construction of improvements or additions to houses offers evidence both of increased income and of easier access to transportation of building materials from Calaca.

PAWA-SANTA MAGDALENA-TALAONGA

The Pawa-Santa Magdalena-Talaonga Road has two principal sections. Of the 9 kilometers section from Pawa to Santa Magdalena, approximately 2.5 kilometers were improved as part of the SIP program in 1976. An additional 1.35 kilometers were improved under the RRP in 1977. The SIP portion had an asphalt surface; the RRP was gravel surface, although 800 meters were later asphalted at the province's own expense. On the nine kilometers section from Santa Magdalena to Talaonga, slightly 4 kilometers have been constructed to date, in two stages -- the first starting in late 1978 and the second beginning in 1979. It is possible that the balance of this section of the road will be constructed in future years. While both sections of the road were characterized as "penetration," the Santa Madgalena-Talaonga portion is more clearly so, since it replaced what had been a mere dirt trail, difficult to transit at any time, and completely impassable by vehicle during the rainy season. The Pawa-Santa Magdalena section was essentially an improvement to a previously existing road which had deteriorated in large part from lack of maintenance.

The activity on this road had both political and security significance. There have also been considerable economic and social impacts on both sections of the road. In the Pawa-Santa Magdalena influence area, farmers have reported substantial increases in rice production as a result of increased use of fertilizer, stemming in part from easier access to fertilizer stores, and the reduced cost of transportation to and from these stores. It is quite possible, however, that these same benefits would have accrued with something less expensive than an asphalt surface. Indeed, the general upgrading which the province did with its own funds along the balance of this section, appears to have been all that was necessary.

There have been dramatic impacts in the Santa Magdalena-Talaonga section. As a result of improved access, use of fertilizer increased as did agricultural production. Higher prices were offered for crops both at the farm and at nearby markets such as Santa Magdalena, Matnog (approximately 4 kilometers from Pawa Junction) and Ilosin (approximately 12 kilometers from Pawa Junction) which has an NGA warehouse. Significant impacts are apparent not only along the approximately 4 kilometers which have already been constructed, but even along the balance of the as-yet-unimproved trail, where for the first time there is vehicular traffic during the dry season.

PALCA ROAD

The Palca road, a major feeder road, is located in the municipality of Tuao in Cagayan province. With a length of 6.3 kilometers, it connects the barrio (barangay) of Palca with a concrete-paved national highway leading to the provincial capital of Tuguegarao, 28 kilometers to the east. Tuguegarao is an important market for the products produced in the influence area of the road and is visited frequently by area residents for shopping, recreation, medical attention, and other purposes. Improvement of the Palca road to an all-weather, gravel standard has provided better access to the national highway and thus to Tuguegarao. It has also stimulated the establishment of a new, twice-weekly market near Palca.

The project was carried out in two phases, the first (3.0 km.) under the Special Infrastructure Program (SIP) which preceded the RRP, and the second (3.3 km.) in 1978. The road, which requires grading every few months for proper maintenance, is in fair condition. Improvements are needed on about 25 percent of the drainage-ditch length.

The influence area of the road was defined as including 16 barrios with a population in 1977 of 11,800. The terrain is flat to rolling. Of the 7,906 hectares being cultivated in early 1978, 5,376 (68 percent) were in rice, 1,483 in corn, 430 in sugar cane, and 405 in legumes. Another 2,000 hectares were in grasslands. Since 1978, some farmers--most of them small--have been growing cotton (an import substitution crop being promoted by the government) in rotation with corn, and have found this to be significantly more profitable than growing only corn. Still, only a small percentage of the area in corn has been converted to a corn-cotton rotation. Another trend, less beneficial to small farmers, has been an expansion of the areas in sugar cane to approximately 1,000 hectares. For the most part, the increase represents the incorporation into production of former grasslands, but some rice lands have also been converted to sugar cane. This may have resulted in the displacement of some tenant rice farmers, but we had insufficient time to fully investigate this issue. Poor rural residents did benefit from increased employment in the cane fields, but this did not provide them with the ability to achieve sustained increases in their income levels, as improved small-farm practices would do.

We found the actual influence area of the road to be smaller than described in the project documentation. Residents in barrios more than about 3 kilometers from the road reported that the road had virtually no effect on their lives. What they needed, they said, were improvements to the barangay roads connecting them with the Palca road.

Only about 10-15 percent of the rice land in the influence area of the road was irrigated, but a new government irrigation project was anticipated in the not too distant future. It was not clear whether this would be the proposed Chico River Dam project, which some observers regard as undesirable because of possible adverse social and environmental effects.

CASTILLEJOS-NAGBAYAN ROAD

The Castillejos-Nagbayan road, classified either as a major or minor feeder road depending on the particular documentation consulted, is located in the municipality of Castillejos in Zambales province. Improvement of this 4.4-kilometer road to an all-weather, gravel standard has provided area residents with year-round access to the town of Castillejos, the principal market for local rice production, and with the Olongopo City-Subic Bay area, some 20-25 kilometers east on a concrete-paved national highway, where fruits and vegetables are sold.

The project was completed in a single phase in 1976 and is in good condition. It was one of the first projects initiated under the RRP, despite an ex ante internal rate of return of 15.6 percent and a benefit-cost ratio of only 1.02. Castillejos, it might be noted, is the home of one of the country's politically most prominent families, which owns land in the project area (though part of these holdings has been affected by agrarian reform programs). A member of the provincial engineering staff agreed that the present road width was too wide for existing traffic (moderately heavy but dominated by tricycles) but believed that it was justified by expected traffic flows in the future. This can be questioned.

The principal crop in the influence area of the road is rice, about one-third of which is grown under irrigation from a system built by area residents before 1900 and maintained and repaired by them with government assistance. Next in importance are sweet potatoes and watermelons. Smaller amounts of corn, peanuts, and other fruits and vegetables are also grown. The terrain is flat, with hills on the eastern fringes of the road's influence area.

Our impression was that the road project accelerated what appeared to have been a prior upward trend in living standards that was facilitated by the availability of irrigation water and various government services (e.g., agricultural extension; a school in Nagbayan since the 1930s; and a health clinic established in the barrio in 1972, headed by a resident registered nurse and providing family planning services). Electrification was brought to Nagbayan in 1976, right after the improvement of the road. The road project appears to have encouraged moderately increased production of sweet potatoes, watermelons, and perhaps other high-value fruits and vegetables, which can now be easily marketed year-round, principally in the Olongopo City-Subic Bay area. Travel between Nagbayan and Castillejos, for a variety of purposes, seems to have increased considerably after the road was improved, providing benefits that are often difficult to measure but nevertheless very real to area residents. Many houses, especially in Nagbayan and along the road close to Castillejos, are concrete block structures. Radios are commonplace, and 7 houses in Nagbayan reportedly now have TV sets.

Records in the Ministry of Agrarian Reform office in nearby San Marcelino show that landownership in Nagbayan is not highly concentrated, there being only one farm of more than 7 hectares as of May 1980. Most farmers, though, are tenants rather than owners; and of the 261 tenants eligible to receive written leasehold contracts under the 1972 agrarian reform law, only 11 had actually negotiated such contracts by the end of 1979. Still, no serious land tenure problems were evident, and many tenants had 2-4 hectares of land.

JCT. VITO-VITO ROAD

The Junction Vito-Vito road is classified as a major feeder road, although it might just as appropriately have been called a penetration road. Located in Negros Occidental province, the road extends from the barrio of Vito on the northern coast, approximately 6.7 kilometers to a junction with a national highway. It has gravel surfacing, except for 0.7 kilometers of concrete paving at the Vito end. The first part of the project (3.50 kilometers) was completed during 1978; the balance, including the concrete paving, was constructed during 1979.

The road impacts upon Vito, a barrio of fishermen, merchants and sugar estate workers; the island of Molocaboc, located within a short boat ride of Vito and populated almost entirely by fishermen; and Bonifacio, a barrio located between Vito and the Junction and inhabited largely by people employed on sugar plantations in the area. Sugar, fish and coconuts are the major products.

Vito is the hub of the area's activities. Fish and some agricultural products are sold there on the weekly market day (Thursday); the Church of San Vicente attracts many of the faithful on Friday, the day of pilgrimage. As a result of the road improvement, this traffic has increased markedly. Receipts to the barrio from the rental of stalls on market day have increased forty percent. Commercial establishments, like restaurants and sari-sari stores, have benefitted from the increase in visitors, and there is evidence of some physical expansion.

While the evidence of the road's impact on fishermen is more ambiguous, it is clear that fish prices have increased at the Vito market, and that the fishermen's options have increased since they can now sell more readily and with reduced spoilage to the wholesale market at the poblacion of Sagay, some eight kilometers from Junction Vito.

The sugar estate workers at Bonifacio and Vito have benefitted economically hardly at all. Indeed, some complain about the higher prices they must pay now for fish at Vito. They do, however, share benefits of improved access to clinics and/or hospitals for medical care.

While passenger traffic on the road is confined to light vehicles (mostly tricycles; some jeeps) which also carry some goods, there are heavy trucks in evidence transporting lime from a nearby quarry and sugar cane from the estates to the Lopez refinery at Sagay. The road improvement has no doubt facilitated this traffic.

MAINIT-SAN MIGUEL ROAD

The Mainit-San Miguel major feeder road in the province of Leyte is located not far from the capital city of Tacloban. Rice is the major crop in the road's influence area and coconut is the only other market crop of significance. The few root crops, corn, and fruit grown in the area are mostly for home consumption. The road improvement involved raising the grade and surfacing with concrete an extension of approximately eight kilometers. The activity was initiated in 1976 under the SIP program and continued in 1976 and 1977 as part of the RRP program. Previously the road had a gravel surface and was in passable shape.

While there appears to have been significant impact on the road's influence area in recent years, it was difficult to trace these to the road improvement. Rather, other activities have been important: a gravity-type irrigation system, affecting approximately 400 hectares of riceland, which makes possible two or three crops a year rather than the one crop that had been the previous norm; a rice warehouse opened by the National Grains Authority near the neighboring poblacion of Alang-Alang, which offers higher prices for palay than can be obtained by selling to middlemen at roadside; a barangay road connecting with the Mainit-San Miguel road, which offers improved access to rice-growing barrios. All of these activities took place at approximately the same time as the Mainit-San Miguel road improvement, and made a significant difference to many people in the area. The RRP road improvement, however, merely put a high-priced finish on an already serviceable road. From reliable reports, the condition of the Mainit-San Miguel road, pre-improvement, was not unlike the present condition of adjoining segments. This condition is adequate to take year-round traffic.

MALTANA-CEBUANO ROAD

The Maltana-Cebuano road, classified as a major feeder road, is located in the municipalities of Tampakan and Tupi in South Cotabato province. According to the project documentation, this is a 7.8-kilometer road, but the stretch between Maltana and Cebuano is actually only 4.8 kilometers long. The other 3.0 kilometers is accounted for by a non-continguous portion of what is (or is to be) a long major feeder road or--perhaps more appropriately--a secondary road that will improve access to the city of Koronodal (the capital of South Catabato), to the west, and to General Santos City, to the east. Remaining portions of this road project are scheduled to be financed by the Asian Development Bank and by the Dole Pineapple Corporation.

The Maltana-Cebuano portion of the road was upgraded to an all-weather standard in 1976. It is in fair condition.

The terrain in the influence area of the road is mostly flat, with hills and mountains on the northern fringe. Corn is the dominant crop, followed by coconuts and rice. Bananas, other fruits, and vegetables are grown, too, and there is a poorly maintained rubber plantation of about 12 hectares. Pigs and chickens appear to be an important source of income for small farmers. There is little irrigation in the area, but some farmers with access to irrigation water can grow three corn crops a year.

The area has a number of 12-hectare farms dating from the colonization period beginning in the 1930s, but some of the original 12-hectare concessions have been subdivided. One landowner in barangay Maltana reportedly has about 400 hectares, with three others having 30-80 hectares each. In barangay Lambayong, five families are estimated to own 30-60 hectares each, not counting land they own in other barangays. Progress under the 1972 land reform program has been slow: of the 543 hectares in corn subject to redistribution in Maltana and Lambayong, only 150 have been formally transferred to tenants, who have received certificates of land transfer (CLTs) for an average of 3.4 hectares.

Improvement of the Maltana-Cebuano road appears to have had a relatively small impact on incomes and living conditions in the area. The impact has been negligible at the Cebuano (eastern) end of the road, since the market orientation of residents there was and still is towards Tupi and General Santos City to the east. Farmers who are oriented toward Tampakan and Koronodal, to the west, have benefited from lower transport costs and better transport service, but these gains have been modest. More important for them seem to have been an increased availability of credit and technical assistance (apparently administered better in South Cotabato than in most other provinces) and the construction of a nearby warehouse by the National Grains Authority (though most corn is now being sold to private buyers since the current market price is above the NGA maximum).

Though South Cotabato, on the whole, has a good record within the RRP, the planning of the Maltana-Cebuano segment--admittedly at a time when the PDS was undergoing serious personnel and organizational problems--was deficient. The absence of a feasibility study was a major lapse, and the patchwork nature of the financing for the longer stretch of road, of which the Maltana-Cebuano segment is but one part, suggests that there may have been some problem in the initial determination of priorities. But this was in 1976, and considerable institutional improvements seem to have been made since then.

SAN MIGUEL-SANTO TOMAS ROAD

The San Miguel-Santo Tomas road, classified as a minor feeder or penetration road but more like a major feeder, is located in the Municipality of Santo Tomas in Davao del Norte province. The A.I.D.-financed portion of the road actually extends for 13.8 kilometers from San Miguel through Esperanza to Kinamayan, with the remaining distance to Santo Tomas (about 8 kilometers) being completed with other financing. Of particular importance has been the completion of a 130-meter bridge--the longest in the project--near the San Miguel (eastern) end of the road. This has made it easier and less costly for farmers to market their produce in the provincial capital of Tagum, which is only a few kilometers from San Miguel but previously was accessible only by an indirect route through Santo Tomas because of the lack of a bridge over the river near San Miguel.

The project was completed in three stages, beginning in 1977 and ending in March 1980. The just-completed last stage, a segment of 4 kilometers, is poorly graded.

Rice is by far the most important crop in this area of flat terrain and will become even more so once an irrigation project is completed, probably in 1983. Corn, coconuts, and bananas are also grown, and some small farmers are beginning to grow high-value fruits and vegetables. The road and irrigation projects are stimulating the clearing of more of the highly productive land in the influence area of the road, where colonization, as in South Cotabato, began in the 1930s. There has also been some self-help construction of barangay roads connecting with the San Miguel-Santo Tomas road. The National Irrigation Administration has made considerable use of the road, which has facilitated work on the NIA's project.

Farmers and other local residents in the area are quite optimistic about the area's future, and rightly so. There has been considerable immigration, not only of new farm owners and tenant farmers, but also of squatters and small business operators opening sari-sari stores and providing transport services. There is reason to be concerned, however, about how the expected increases in income are going to be distributed. While it is clear that almost everyone in the area has derived some benefit from the road, at least up to the present time, medium- and large-scale farms are dominant and small tenant farmers may have difficulty acquiring land of their own. In addition, as described in the main body of this report, some small farmers who have been on their land for many years, but with an unclear tenure status, are being threatened with eviction to make way for a large corporate rice-growing scheme sponsored by the provincial government. Another group of small farmers, who recently settled on abandoned private land and have established a well-organized community, also face an uncertain future. In summary, the road project appears to be making an important contribution to increased production in an underexploited area of high agricultural potential; but its impact on income distribution could well be negative unless steps are taken to protect the interests of small farmers currently in the areas and to provide more opportunities to those who would like to migrate there.

APPENDIX C

ENGINEERING REVIEW

The engineering review basically encompassed the examination, review, and evaluation of: (1) planning and implementing institution arrangements; (2) design, together with its related impact on road usage and related costs; (3) construction and maintenance costs and procedures; and (4) actual vehicle usage, together with related benefits achieved by the rural roads projects.

Procedure

Interviews were conducted and pertinent files examined at the USAID and the MLGCD (Ministry of Local Government and Community Development) offices in Manila. Project sites were visited (two days per site) and observations made t traffic densities, road and maintenance practices, the construction equipment and maintenance, the provincial zation, the local contractor capability, and the environmental influences of the rural road construction. Findings were based on visual examinations; on interviews with road users (both vehicle operators and their customers); and on discussions with provincial planning, engineering, and operating staff personnel. Many interviews, particularly with provincial GOP personnel, were conducted together with other members of the AID/W and USAID field staff team.

Forms and questionnaires, prepared prior to the field visits, were followed in so far as practicable. Some deviations were made as a result of responses which led to minor changes in the general flow and approach of selected interviews. Generally, however, the questionnaire formed the basis of the data and information compilation.

During the site visits, partial one- and two-day traffic counts were taken, both visually and with mechanical counters where available. These were partial counts which provided a general indication of the probable traffic types and densities. However, they are subject to seasonal, climatic, and daily fluctuations which can significantly influence the partial results obtained over a short two-day period of observation.

Manila Review

The first week of the in-country review, between April 28 and May 3, 1980, was spent in Manila reviewing USAID files, selecting the projects for site visits, planning the logistics and itineraries for the visits, and dicussing our assignment with USAID and MLGCD staff connected with the rural roads program.

USAID: At the USAID, the criteria for initiating and implementing the program (see Appendix A) were reviewed with the Mission staff. Current progress and disbursement data had been tabulated by the Mission and were used by the team to select road sites to be visited.

Following the site selection, available feasibility studies, construction drawings, and budget allocations were examined and reviewed, together with information pertaining to planning, design, construction and project implementation. A meeting at the USAID with a local World Bank consultant provided a viewpoint which favored capital-intensive construction by contract,with maintenance only to be undertaken by the provinces. This is apparently the emphasis being considered by the World Bank in its follow-on program of rural road projects. Justification, as presented by the consultant, was based on unavailability of labor to perform the construction under labor-intensive procedures. He reported labor shortages and no real unemployment, a finding which was discounted during our field visits, as provincial engineers reported a ready availability of labor at all times throughout the year.

MLGCD: This office, under the Deputy Minister for Local Government, is responsible for administering the Rural Roads Program. It is divided basically into two units, a project development and evaluation unit dealing with technical features and an administrative unit dealing with budget and fiscal matters and providing general services support. Programs and projects are developed at the provincial level and then submitted to the provincial governor for approval and selection. Following selection, feasibility studies and implementation plans are prepared by the provincial staff and submitted to the MLGCD office for review by its consultant and approval. When approved, the MLGCD authorizes disbursement of 15 percent of estimated project costs -- i.e., 60 percent of the 25 percent provincial government contribution towards total project construction cost as seed funding in the form of a grant.

To assist provinces in developing their rural roads capability, the MLGCD has a preliminary pilot program to allow new provinces to participate. It will assist in financing a first gravel-surfaced road project to provide a test of provincial capability.

The MLGCD is experiencing problems in retaining technical staff, particularly engineers. Its government wage scale of 1,000 to 1,500 pesos per month is well below the 3,000 to 4,000 pesos paid on the outside. Only the senior people stay on, and the younger staff only remain long enough to gain experience while seeking other employment.

In the provinces, equipment and road maintenance present problems. Emphasis is on new construction, with older equipment relegated to maintenance operations and newer equipment to construction work. The older equipment, obtained from military excess property inventories, suffers from difficulties in obtaining spare parts through commercial channels.

Initially, all construction was performed by force account. Now, some work, principally bridges, is being performed under construction contract procedures. Some local contractors rent construction equipment from the Ministry of Public Highways. Some provinces also obtain the use of such equipment for force-account construction.

Site Reviews - Team I

The second and third weeks of the in-country review, between May 4 and 16, 1980, were spent in the field visiting the eight project sites selected for review. Team I, visited the Junction Vito-Vito, Mainit-San Miguel, Calaca-Madalunot, and Pawa-Santa Magdalena road projects.

Junction Vito-Vito Road: This project, implemented by force account in two phases of 3.5 kms. and 3.24 kms. (total of 6.74 kms.) was completed in 1979. It is a gravel-surfaced road except for the last 900 meters, which are concrete-paved through the community of Vito to minimize dust problems. It traverses a generally flat to slightly rolling terrain and was constructed at a FAR cost of 1,049,000 pesos ($142,700). Presuming the FAR cost to be 75 percent of the total, the unit cost was about $28,200 per km. The road is more than 6 meters wide with a 1.5-meter gravel shoulder on each side. It has an 8-inch gravel base and a 4-inch gravel surface course.

At the time of visit, Monday/Tuesday, May 5/6, 1980, under fair weather, the roadway appeared in good condition, with a relatively smooth riding surface and with only a few minor potholes. A grader and roller were working to smooth selected rough areas of the gravel road surface, and a crew was cleaning and cutting vegetation along the side drainage ditches. From physical appearances, it seemed that this was the first maintenance that this road had received since its completion the previous year. Also from physical appearances, it did not seem that a great deal of maintenance was needed.

Traffic counts showed 198 vehicles on Monday and 284 vehicles on Tuesday. About seventy percent (137 and 184) of the vehicles were of the light type, mostly tricycles with some motorcycles, bicycles, and jeepneys. The remaining thirty percent (61 and 100) were two-axle trucks of 5 to 8 tons loadings.

The tricycles and jeepneys carried passengers with some bags of cargo, mainly copra, to the junction with the main highway. The trucks came in empty and carried out sugar cane (it was harvest time) and lime from a nearby quarry.

Traffic counts made in October 1977, before improvement, showed 50 to 80 vehicles per day, 60 percent of which were trucks and 40 percent cars, jeepneys and other vehicles. Future projections made at that time indicated traffic counts of 400 to 550 vehicles per day three to ten years hence, consisting of 90 percent trucks and 10 percent other vehicles.

Interviews with vehicle operators disclosed that tricycles appeared after the road was improved. Prior traffic consisted mainly of trucks and some jeepneys. Now 15 tricycles operate between Vito and the Vito highway junction, each making an average of three round trips per day. Passenger fare is 1.5 pesos each way, and cargo by the sack is charged the same rate.

One passenger jeepney now operates this route, compared with three before the road improvement. Four daily trips are made instead of two or three trips. Tires are now changed every 4 months, compared with every two months before. Fuel consumption is now 5 liters per day for 3 round trips versus 10 liters previously, and spring breakage and replacement has been minimized. The passenger fare was 0.75 pesos before the road was improved, rose to 1.25 pesos after improvement, and now stands at 1.5 pesos as a result of a recent allowance for fuel cost increases. The jeepney owner/operator indicated that the increased competition from tricycles has lowered his daily income from 80 pesos to 70 pesos.

Sari-sari store operators noted a distinct benefit from the road improvement. Distribution agents now make deliveries in Vito, whereas before, store operators obtained goods in nearby Sagay. This often entailed a long wait at the Vito junction, sometimes for hours, for transportation of purchased goods into Vito. In making purchases from agents, prices were initially competitively lower, but because of rising costs prices are now as high as before. However, store operators admit to a fuller inventory of stock and an increase in sales and income.

Mainit Junction - San Miguel Road: This project, implemented by force account in 5 phases, 3 under SIP and 2 under RRP, was initiated in 1974, and completed in 1977. The FAR cost for the total length of 8.0 kms. was 2,566,000 pesos (approximately $349,100). Presuming a FAR cost of 75 percent of the total, the unit cost for construction was about $58,200 per km. The roadway has a 6-meter-wide concrete surface plus a 1.5-meter gravel shoulder on each side. It consists of a 12-inch gravel sub-base, a 4-inch gravel base course, and a 6-inch concrete surface.

At the time of the visit, Thursday/Friday, May 8/9, 1980, under fair weather, the concrete road surface was in good condition. It was rice harvest time, and the concrete pavement was being used throughout as a drying surface. The gravel shoulder was overgrown with vegetation throughout, and the heavy vegetation growth was encroaching on the width of the concrete pavement. The first 100 meters from the Mainit Junction with the national highway was unsurfaced, awaiting a decision by the Ministry of Public Highways on the relocation of a new Mainit River bridge.

Initially, the team made a circuit swing from the Mainit Junction with the national highway along the improved road to San Miguel (8.0 kms.), continuing on the gravel-surfaced provincial road to Barugo (12 kms.) and on to Carigara (6.5 kms.), the upper junction with the national highway, then returning on the concrete surfaced national highway, through Tunga and Jaro (24 kms.) to the Mainit Junction. On the national highway Tunga Creek is forded by a low-water crossing which floods during periods of heavy rainfall, causing roadblocks. The national highway traffic between Mainit Junction and Carigara is diverted through San Miguel and Barugo along the provincial road. Stacks of concrete piles for bridge foundations were noted at the Tunga Creek site and other proposed replacement bridge locations. These stacks were overgrown with vegetation, indicating some delays in implementing the bridge program. Similarly, 5 to 6 older wooden bridges and one Bailey bridge along the provincial road between San Miguel and Carigara are programmed for replacement, including two under the FY 80 RRP.

No maintenance needs were indicated for the concrete road surface. The side gravel shoulders were completely overgrown with vegetation, as were the side drainage ditches, indicating little or no maintenance effort to control and limit weed growth. The vegetation growth was encroaching on the concrete pavement and reducing its visible width.

It was reported that concrete surfacing was used because this was the most heavily travelled provincial road and that this was a typhoon area with rains throughout the year and with no pronounced dry season.

Traffic counts showed 301 vehicles on Thursday and 412 on Friday passing the counting station near the Mainit Junction. This is a through road continuing from Mainit Junction to San Miguel and then to Barugo, and therefore a counting station was also established at the point where the road left San Miguel for Barugo. Traffic counts there showed 243 vehicles on Thursday and 226 on Friday. By subtraction, it could be estimated that 58 and 186 vehicles, respectively, served the influence area of the road between the two counting stations. However, some of the through vehicles also provided service to the area of the road improvement. Therefore, the traffic count for the Mainit Junction/San Miguel influence area no doubt reflects something larger than the counts of 58 and 186 obtained by subtraction. An exact count would require tracing the routing of each vehicle passing along the road, something beyond the limited scope of this survey. The larger count Friday may also be attributed to the weekly market at Alangalang a few kilometers along the main highway from the Mainit Junction. San Miguel has no market day.

The traffic count at both stations reflected the passage of jeepneys and motorcycles which made up 90 percent of the vehicles, trucks and busses making up the remainder. Most of the jeepneys transported passengers and bags of copra and rice, and the motorcycles provided transport along the barangay roads off the provincial road for both passenger service and goods. Some jeep trucks were transporting only rice since this was the rice harvest period.

A five-day traffic count, made in June 1975, showed daytime traffic volumes from 151 to 212 vehicles, divided equally between cars and trucks. A three-day, 24-hour count in February 1978 and a three-day 24-hour count in March 1979 showed an average daily count of 410 to 741, with one day only as low as 190. Without further information, it is difficult to reconcile such large differences between the various traffic counts. The large counts could possibly be the result of the diversion of national highway traffic because of its blockage at the low-water Tunga Creek crossing.

Interviews with jeepney operators showed that the usual route of travel was generally two round trips per day to Tacloban, the provincial capital some 40 kms. from San Miguel. The majority of the jeepneys originated in Barugo and picked up passengers and goods as they passed through San Miguel.

Most vehicles transiting the road comprised jeepneys, hauling both passengers and cargo, some mini-trucks, motorcycles, one bus, and one tricycle. The mini-trucks were carrying rice at 0.95 pesos per kilo which was sold for 1.08 pesos per kilo. Net income per kilo after operating expenses was about 0.03 to 0.05 pesos, lower than before because of increased fuel costs.

One jeepney driver interviewed stated that he charged 4 pesos from San Miguel to Tacloban for passengers. This driver, who started working the route in 1978, advised that the fare had been 2.5 pesos previously. Another jeepney driver's rates were 4 pesos from Barugo and 3.5 pesos from San Miguel to Tacloban. A passenger jeepney driver operating between Santa Cruz, 12 kms. east of San Miguel, advised that his rates were 6 pesos per passenger from Santa Cruz to Tacloban, 3.5 pesos to Alangalang, and 2.0 pesos to San Miguel. This is a new service, with 6 jeepneys each now making one round trip per day. Before, transport was by motorcycle or on foot. The new service is the

result of the improvement of the San Miguel/Santa Cruz road with a gravel surfacing, performed by the municipality and the province, following the concrete surfacing of the study road. Generally, the passenger jeepneys charged the passenger price for each bag of rice or copra carried.

The one bus driver interviewed reported that 4 to 5 buses used to make the run from Barugo to Tacloban, but because of poor management only two remained. Before, he made only one round trip daily, but with increasing passenger traffic he now makes two. Passenger rates were four pesos from Barugo to Tacloban and three pesos from San Miguel. For rice the rate is three pesos per sack.

The motorcycles carried passenger and cargo traffic along the unimproved side roads leading off the study road. It was interesting to see a motorcycle carrying 4 passengers, driver, and goods attached to the side, or tricyles with 9 and 10 passengers and goods on the roof. Motorcycle rates were five pesos per passenger from San Miguel to Santa Cruz and 1 peso to Alangalang.

Only one tricycle was noted on the road during the visit. It was on a special trip, hauling rice for the vehicle owner from San Miguel to nearby Jaro where the tricycle normally operates.

In an interview, a sari-sari store employee in the center of San Miguel reported a notable increase recently in the movement of traffic and people through the community. This had resulted in more business at the store with an accompanying increase in profit.

Calaca-Madalunot Road: This project was performed by force account in two phases of 2.5 kms. each, for a total of 5.0 kms., in 1977 and 1978. The FAR cost was 901,000 pesos (approximately $122,600). Presuming this to represent 75 percent of the total, the unit cost for construction was about $32,700 per km. The roadway is gravel surfaced, 6 meters wide with a 1.5-meter gravel shoulder on each side, and traverses a hilly terrain. Phase III calls for a 7-km. extension from Madalunot through Tamago to Balbaguhan (now a one-lane dirt track), making a connection with the national highway network to shorten the distance from Calaca to Manila.

The construction consists of an 8-inch gravel base course and a 4-inch gravel surface course. At the time of the site visit, Monday/Tuesday, May 12/13, 1980, the roadway appeared in good condition with a relatively smooth riding surface and only a few minor potholes. Some drainage ditches were filled with vegetation, and one major cross-drainage culvert was in danger of being washed away as a result of serious erosion and undercutting around its headwall. During the visit, a grader was working along the edges of the road reshaping the side drainage ditches.

At the upper end of the road near Madalunot, vegetation growth had encroached on the shoulders and was beginning to appear on the roadway. The traffic flow had developed a weaving one-lane wear on the riding surface, indicating a low traffic volume and leaving a large area of available riding surface unused.

Eight-hour traffic counts showed 60 vehicles on Monday and 49 on Tuesday, consisting predominantly of tricycle traffic (50 percent on Monday and 70 percent on Tuesday). Another 20 to 30 percent of the traffic volume were jeepneys principally carrying water cargo into an area of no water supply.

No previous traffic counts exist because this is a new penetration road constructed along a trail previously limited to transit by animal and foot. Traffic projections made during planning showed 18 vehicles per day one month after completion, 21 after one year, 27 after 3 years, 33 after 5 years, and 55 ten years after completion. Such low projections raise doubt concerning the road's economic feasibility and justification.

Jeepney traffic was reported to be very irregular from and to Calaca. One farmer living in Madalunot had just purchased a rebuilt jeepney and planned to provide service from Madalunot to Calaca on Wednesday, which is market day at Calaca. He will charge 1.5 pesos each way per passenger, 2 pesos per cavan of rice, 4 pesos per 1,000 bananas, and 0.05 pesos per coconut. During harvest time, he expected to operate daily, and he was prepared to respond to any requests for his transportation services.

There were six tricycles, owned by farmers living along the road, providing daily service. Most make about 10 round trips per day from Madalunot to Calaca, and on market days this increases to 15 and 20 round trips. Passenger rates were 1.5 pesos each way. A housewife travelling with her child reported that she makes a daily trip to Calaca to buy food and other goods for her household. On this trip, she paid for 3 fares to leave Calaca at once so as not to wait for the tricycle to fill to its capacity of 4 passengers.

Trucks were reported to come into the area on Fridays to purchase livestock for sale at the Saturday market in Lemerey, about 7 miles east of Calaca. A housewife living along the road had an interesting reaction to the study road. Before the road, there was no traffic and no dust. Now the road brings in more traffic, and more people go to Calaca. This causes a lot of dust, and she now favors asphalt surfacing to keep the dust down.

Pawa-Santa Magdalena Road: This 9.1-km. road was originally an asphalt-surfaced road, but it deteriorated from lack of maintenance. At the time the RRP was initiated, the provincial governor was from Santa Magdalena, and this road received a high priority in provincial planning. Phase I, under the SIP, consisted of 2.5 kms. of asphalt surface treatment starting at Pawa, and was completed in 1976 under force account at a FAR cost of 450,000 pesos (approximately $61,200). Assuming that the FAR cost was 75 percent of the total, this translates to a unit cost of about $32,600 per km. Phase II under the RRP continued in 1977 with a 1.4-km. extension of gravel-surfaced road on which the province placed asphalt surfacing over 800 meters with its own funds. The FAR cost was 201,000 pesos (about $27,300), and presuming the FAR cost to be 75 percent of the total, the unit cost for this section was approximately $26,000 per kilometer.

Phases I and II raised grades to eliminate flooding. The province later provided 50,000 pesos ($6,800) for rehabilitating the remaining 5.2 kms. under a heavy maintenance program. This section of the road was apparently in reasonably stable condition; some filling of potholes, reshaping of the roadway surface, and 2 kms. of asphalt treatment was sufficient to complete the road work. All work was performed by force account.

Improvement of this road network was continued with a new penetration road initiated along the 9.0-km. trail from Santa Magdalena to Talaonga. Phase I

was completed in 1978 on the first 3.0-km. segment, at a FAR cost of 367,000 pesos ($49,900) or, presuming the FAR cost to be 75 percent of the total, $22,200 per kilometer. Phase II, a 1.0-km. continuation, was completed in 1979 at a FAR cost of 174,000 pesos ($23,700), and presuming the FAR cost to be 75 percent of the total, the unit cost for this section was about $31,600 per km. Phase III is programmed for 1980, and consists of further 2.0 km. extension at an estimated FAR cost of 500,000 pesos ($68,100) which translates to a unit cost of $45,400 per km. if the FAR cost is 75 percent of the total. The segments constructed under the RRP are 6 meters wide, gravel surfaced, with 1.5-meter shoulders on each side. An 8-inch sub-base is overlaid with a 4-inch gravel surfacing. All work was performed by force account.

At the time of the site visit, Wednesday/Thursday, May 14/15, 1980, the riding surface from Pawa to Santa Magdalena was fairly smooth, with some scattered rough sections but no indications of serious potholing. Some patching of potholes was evident, but there was little indication that vegetation and debris had been cleaned from the side drainage ditches.

The improved road segment from Santa Magdalena to Talaonga was beginning to show vegetation growth along the side ditches and shoulders, and in some areas this was also starting to encroach on the roadway, a result of the relatively small flow of traffic. Neither road segment showed any indications of having received any recent maintenance work by a motor grader.

The older, unimproved section of the Pawa-Santa Magdalena road showed considerable pavement damage and loss along the sides of the roadway, particularly through the barangays where sharp 3 to 6-inch drops were noted at the edges of the paved roadway surfaces. This loss of pavement, together with the resultant sharp drop, was limiting and cutting back on roadway width.

A three-hour traffic count (2 to 5 p.m.) at Pawa on Wednesday, May 14, showed the passage of 39 vehicles, consisting of 29 tricycles, 4 jeepneys, 4 motorcycles and 2 trucks. A six-hour count was made at the Pawa junction and at the Santa Magdalena junction on Thursday, May 15. At Pawa, 226 vehicles passed, consisting of 194 tricycles, 10 motorcycles, 19 jeepneys, and 3 trucks. This was market day in Matnog, located 4 kms. from Pawa junction.

At Santa Magdalena, two counts were made, one north to Talaonga and a second west to Pawa. The north count showed 147 vehicles, including 72 tricycles, 3 motorcycles, 71 jeepneys, and 1 truck. The west count showed 231 vehicles, consisting of 150 tricycles, 19 motorcycles, 61 jeepneys and 1 truck. May 15 was the feast day for the barrio of San Isidro, 4 kms. west of Santa Magdalena. This count was influenced by the large number of vehicles, mainly the jeepneys, shuttling between Santa Magdalena and San Isidro.

The seven-hour traffic count before the recent improvement, taken at Pawa on July 31, 1976, showed 180 vehicles. This was a feast day for Santa Magdalena, resulting in an upward bias count. Projections during the planning of the road showed 180 vehicles 1 month after completion, 185 after 1 year, 194 after 3 years, 216 after 5 years and 240 after ten years.

Before the road improvements, there were three tricycles working out of Santa Magdalena to Pawa, reportedly providing irregular service, and three jeepneys operating mainly to Irosin. Now, there are 25 tricycles to Pawa and Matnog and eight jeepneys operating to Talaonga, Irosin, Bulan and Sorsogon.

The tricycles operate between Santa Magdalena and Pawa. Some go on to Matnog, 4 kms. along the National Highway from Pawa. Matnog is the port from which ferry service departs for northern Samar.

Two principal market days are observed, Thursday at Matnog and Sunday at Pawa. Most produce is transported to Matnog except on Sunday when it stops at Pawa, before Matnog.

Passenger rates are 2 pesos from Santa Magdalena to Pawa, 1 peso from Pawa to Matnog, 1.75 pesos from Santa Magdalena to Talaonga, 3.20 pesos from Santa Magdalena to Irosin, 4.95 pesos from Talaonga to Irosin, and 6.45 pesos from Santa Magdalena to Sorsogon. Rate increases were recently granted as a result of increased fuel costs. Prior to this increase, passenger rates were 1.50 pesos from Santa Magdalena to Talaonga, 2.90 pesos from Santa Magdalena to Irosin, and 4.40 pesos from Talaonga to Irosin.

Most produce is generally for home consumption. Now, with transport always available, the farmers are beginning to sell some goods, mostly to intermediaries at Matnog for transshipment to Sorsogon. Much bartering is conducted, with produce brought to Matnog exchanged for needed household goods.

Transport costs for goods are generally one peso per cavan or bundle of goods transported. This represents an increase from 0.50 pesos prior to the rate revisions.

Interviews at PEOs (Provincial Engineering Offices). Generally, the PEOs visited by Team I had similar organizational structures. There were two basic units, one covering administration, programming, and planning services and a second including the construction, maintenance and equipment pool services. All PEOs expressed their concern for trying to maintain competent professional staffs, given government wage scales (500 to 1,500 pesos per month for beginning civil and supervisory engineers) well below those in private industry (1,000 to 5,000 pesos per month). As a result, only younger engineers and recent graduates are attracted to the provincial jobs. They stay on these jobs from one to three years, only long enough to gain experience, while seeking and obtaining other better paying opportunities.

Negros Occidental, the province of the Vito road, did not appear to have as much of a personnel turnover problem as the other three provinces. It had an extremely large and active program which had included the planning and construction of a sports stadium, schools, public markets, a cafeteria/restaurant, as well as roads. It also has a subsidized housing ownership program for its employees, plus other fringe benefits. This has helped it retain much of its older staff, but vacancies remain at the junior levels.

Except for some scattered bridge work, all these provinces performed the road construction under force account procedures, and they reported no problems in staying within the funding budgeted for the road projects, particularly since the 15 percent petroleum adjustment made to project costs in 1979. All provinces reported delays in receiving the 15 percent GOP seed-capital contribution. In some cases this was not received until after project completion. However, this did not delay the initiation of work, since the provinces proceeded with their own funds pending receipt of the GOP funds.

All provinces seemed to favor force account work, due mainly to a shortage of capable local road contractors and to a better control over costs and quality. They also favored limiting the labor input to drainage structures and bridges and the use of equipment for earth movement and for the transport, placement, and compaction of roadway base courses.

Visits to offices and shops conveyed an impression of staff underutilization, particularly in the equipment repair shops and materials testing laboratories. These provinces had extensive equipment pools (60 to 120 units), but in the repair shops, with reported staffs of 20 to 40 mechanics, only a bare minimum of work appeared to be in progress. Spare parts inventories were minimum, and many dead-lined pieces of heavy equipment -- mainly those obtained from U.S. excess property sources -- were awaiting final disposal. It was reported that spare parts were not available through usual commercial channels, and that costs of repair and maintenance were becoming excessive, justifying disposal and replacement. In most shops, heavy repairs were contracted out.

Similarly, little or no real activity, other than some possible "busy-type work," perhaps occasioned by our visit, was in progress. In no laboratory was any test work in progress during our visits.

As much as 40 to 60 percent of the annual provincial budget is allocated to the PEO for road construction and maintenance, together with smaller amounts for public works projects such as schools, markets, and water supplies. The provincial budget funding includes the GOP national allocation to provincial road maintenance. It was reported that once received, however, most of this allocation is used by the province for other uses.

It was also noted that little road work is programmed with provincial funding only. Practically all new road construction is that performed under the USAID RRP program. Under this program, USAID reimburses up to 75 percent of the construction cost under FAR procedures, the GOP contributes 15 percent, and the province 10 percent. Under the FAR, USAID reimburses the costs for standard items of road construction, including materials, POL, and direct labor. The PEO finances the project administration, equipment maintenance/ rental, land, and contingencies. On some projects, it was reported that the PEO/GOP participation had reached 35-40 percent.

Site Visits - Team II

The following are summaries of the four sites visited by Team II, of which the AID/W engineering consultant was not a member. The data wasobtained by the USAID local engineer assigned to Team II.

Palca Road, May 5/6, 1980. This is a 6.3-km., gravel-surfaced road with a 9.0-meter travelway, including 1.5-meter shoulders on each side. It was completed in 1978, and constructed by force account in two phases: 3.0 kms. in Phase I under SIP at a FAR cost of 250,000 pesos and 3.3 kms. in Phase II under RRP at a FAR cost of 228,000 pesos. Provincial records, however, show that actual direct costs reimbursable by A.I.D. under the SIP phase were 199,000 pesos, and if these constituted 75 percent of the total costs the latter figure would be 265,000 pesos. On the other hand, there was a cost

overrun of 31,000 pesos during Phase II, bringing its total cost to a presumed 335,000 pesos. The total construction costs for the road are thus estimated to have been 600,000 pesos ($81,600) or $13,000 per kilometer.

During the visit, it was noted that some of the side drainage ditches had become overgrown with vegetation along about one-fourth of its length and needed improvement. One 400-meter section of the riding surface had deteriorated and needed additional gravel aggregate surfacing. Otherwise, the road surfacing provided relatively smooth riding.

A 12-hour traffic count conducted from 6:00 a.m. to 6:00 p.m. on May 6, showed a passage of 275 vehicles, consisting of 83 animal-drawn carts, 71 jeeps/jeepneys, 45 motorcycles, 22 tricycles, 24 trucks and 30 farm tractors. A count conducted before the road improvement showed 152 vehicles per day, with projections of 305 in 1980, 319 in 1982 and 360 in 1987.

Passenger rates from Palca to Lacambini, at the northern end of the road where it joins a national highway are 1.00 by jeepney or calesa (horse-drawn cart). Residents of barangay Dagupan, connected to the Palca road by a newly-improved barangay road, used to take their rice by carabao sledge to Lacambini. They now prefer a jeepney, which costs 1.50 pesos per cavan and takes much less time than the 3-hour trip (one-way) by sledge. Transport rates for passengers to Lacambini from remote barrios, accessible by jeep/jeepney only part of the year, are as high as 2.50 pesos.

Castillejos-Nagbayan Road, May 8/9, 1980. This is a 4.4-km., gravel-surfaced road with a 9.0-meter travelway, including 1.5-meter shoulders on each side. It was built by force account under the RRP in 1977. Drainage and surfacing appeared to be in relatively good condition, with adequate drainage capacity and a firm and fairly smooth riding surface. The FAR for this road was 323,000 pesos ($43,900); there were no cost overruns. This implies a total cost of 431,000 pesos ($58,600), or $13,300 per kilometer.

A 12-hour traffic count conducted from 6:00 a.m to 6:00 p.m. on May 9 showed a passage of 472 vehicles, consisting of 340 tricycles, 39 motorcycles, 50 jeeps/jeepneys, 22 trucks, and 21 animal-drawn carts. This was the market day for Castillejos and thus one would expect the average daily count to be lower. A traffic count made in 1975 before the road improvement showed 172 vehicles per day. Projections before construction indicated potential vehicular traffic of 188 per day one year after completion, 219 two years later, 260 after five years and 328 ten years after completion.

According to a barrio councilman in Nagbayan, the trip from Nagbayan to Castillejos cost 0.50 pesos per passenger or cavan of rice in 1975, when jeeps could get through only in the dry season; calesas also charged 0.50 per passenger or cavan. Now, 7 jeeps/jeepneys travel the route (compared with one in 1975), as well as 6 tricycles; calesas no longer make the trip. Jeepneys charge 0.75 pesos per passenger or cavan, while tricycles charge 1.50 (or 3.00 for only one passenger). Several farmers, though, reported paying only 0.50 pesos per cavan of rice.

Maltana-Cebuano Road, May 11-13, 1980. This is a 7.8-km., gravel-surfaced, discontinuous road project, with a 9.0-meter travelway, including 1.5-meter shoulders on each side. It was constructed by force

account (except for hauling) in three phases as follows: Phase I, 1.2 km. from New Pangasinan to New Concepcion; Phase II, 1.8 km. from Santo Nino to New Pagasinan; and Phase III, 4.8 km. from Maltana to Cebuano. Included in this road network are three bridge projects totalling 197 meters in length. FAR costs were 507,500 pesos for the 7.8 kms. of road, making total costs a presumed 676,700 pesos ($92,100) or $11,800 per kilometer. FAR costs for the three bridges were 545,000 pesos, making total cost a presumed 726,700 pesos ($98,900), or $500 per lineal meter.

The PEO reported that all construction work in 1976-77 had been done by force account, but that because of equipment shortages road and bridge construction in the province was now being done under contract. This suggests that there is considerable underemployment among the 617 employees of the PEO. During the visit, the road surface appeared relatively smooth and well maintained. Some scour and erosion were noted at drainage channel outlets, and one such situation indicated a need for immediate repairs.

A 12-hour traffic count from 6:00 a.m. to 6:00 p.m. on May 13, showed the passage of 136 vehicles, which included 45 motorcycles, 27 jeepneys, 9 trucks, 13 animal-drawn carts, 6 tricycles, 1 farm tractor, 33 provincial road maintenance trucks and 2 highway graders. A count made in 1976, before any improvements had been made, showed 100 vehicles per day. Projections for traffic flow following improvements indicated 140 vehicles per day one year after completion of construction, 220 after three years, 380 after five years and 510 after ten years. The total length of road network to be constructed is 21 km. and the remainder of the work will be funded under a program with the ADB (Asian Development Bank).

A resident of Kipalbig, half a kilometer off the road and an additional 1.5 kilometers from Maltana, reported that the passenger fare to Maltana, by tricycle is 0.75 pesos; he prefered to walk. Jeep service was also available, but the fares quoted to us were for distant locations beyond Maltana or Cebuano, where roads had existed for a number of years. Several transport operators reported that they charged more than the regulated rates. Farmers reported considerable competition among marketing intermediaries, whose margins are relatively small.

Santo Tomas-San Miguel Road, May 14-16, 1980. This is a 13.8-km., gravel-surfaced road with a 9.0-meter travelway including a 1.5-meter shoulder on each side. It was completed by force account in three phases, 1.0 km. (Phase I) in 1977, 4.0 km. (Phase II) in 1978, and 8.8 km. (Phase III) in 1979-80. Eleven kilometers remain to be constructed to complete the improved road section. In addition, three bridges totalling 132 lineal meters have been constructed. FAR costs to date are 1,993,600 pesos, making total costs a presumed 2,658,100 pesos ($361,600), or $26,200 per kilometer. FAR costs for the three bridges were 1,960,000 pesos, with total costs being an estimated 2,613,300 pesos ($355,600), or $2,690 per lineal meter. The last 4 kilometers of the road were not well graded.

A 12-hour traffic count conducted from 6:00 a.m. to 6:00 p.m. on May 15, showed the passage of 272 vehicles, comprising 147 tricycles, 45 motorcycles, 65 jeepneys, and 15 trucks. This is a new penetration road (though it is also referred to as a minor feeder road) and thus had no traffic count before its

construction. Traffic projections made before construction indicated a potential of 227 vehicles three years after completion, 249 after five years, and 282 after ten years.

Completion of a 120-meter bridge near San Miguel has provided farmers much better access to Tagum, the provincial capital, located just a few kilometers east of San Miguel. Residents of Kinamayan, where the road improvements end (extension to Santo Tomas is underway), used to travel 60 kilometers via Santo Tomas to get to Tagum; the direct route made possible by the bridge is only 19 kilometers. Passengers on the direct route pay 4.50-5.00 pesos to go to Tagum by motorcycle, jeep, or tricycle, compared with 6.20 pesos via the long route.

Transport costs for rice vary from 3.00 to 4.50 pesos per cavan; full jeeploads receive the lowest rates. (Much of the rice, though, is marketed in Santo Tomas, which is closer.) Transport rates exceed regulated rates, and cost savings thus seem modest compared with costs on the longer route; but local residents valued the savings in time and the more frequent service resulting from the road and bridge construction.

The PEO has about 360 full-time employees and a total of about 600 at the height of construction activities. Loss of graduate and registered engineers to private industry has been a serious problem.

Staffing and Equipment. All provinces visited by Team II are staffed and equipped to perform the planning and implementation of provincial road construction by force account.

Equipment pools are extensive and comprise in excess of 50 units of heavy road construction equipment and trucks in all provinces. They consist of new units acquired under equipment loans and other, older units from U.S. excess property sources. In the case of one province, as much as 30 to 35 percent of the inventory is deadlined, awaiting repair or scheduled for disposal. Large numbers of mechanics and mechanic helpers appear to be underutilized, since it is reported that major overhauls are contracted to private shops.

Exit Interview with USAID May 17, 1980

In discussing the assignment of road maintenance responsibilities for sections of the road to the barangays along the route, the USAID believed it would be difficult to get barangays to participate. Mission personnel felt that, since barangay residents had little voice in planning and construction, and considered the projects basically as provincial government undertakings, they would tend to feel that the provincial government should assume responsibility for maintenance.

When the evaluation team discussed the quality and depth of the feasibility studies, one USAID technician questioned the merits of detailed studies in view of the relatively small amount of investment per road project.

In the discussing the relatively high design standards, considering that traffic volume consists mainly of relatively light vehicles (tricyles, motorcyles, jeeps) and only a few trucks, it was noted that these standards were required by the Ministry of Public Highways. Otherwise, the MPH would

not release national funds to the provinces for maintenance. However, we were advised that these standards will be revised downward under the proposed follow-on program, which also is to give more emphasis to penetration roads.

The proposed follow-on program will also consider more contracting and labor-intensive construction practices. Selected pilot road projects will be examined and explored to evaluate the potential for labor-intensive construction procedures.

The large turnover of provincial technical and professional staffs has had detrimental effects on institutionalized training programs, resulting in a general failure to follow through and maintain continuity in the training efforts. Barangay roads are held back because of shortages of funding and of qualified consultants to assist in administering and supervising the road construction and improvement work.

Summary Finding

1. The principal benefit afforded by the provincial road projects was that of movement, which is now free and unhampered, whatever the weather and the time of day. As expressed by one person, "now I can go to sleep at night feeling secure that, in case of an emergency, I have access to assistance." A sari-sari store owner valued the time saved and the better supply of goods for sale since deliveries are now made directly to the store, where formerly goods had to be purchased in neighboring market centers and brought in by the store owner under time-consuming, uncertain and irregular conditions of transport. Farmers who formerly raised crops for family consumption are now taking advantage of nearby markets to sell and/or barter some produce for needed household goods. Others who previously marketed produce are benefitting from more competitive sales at the farm gate as more buyers are appearing in the areas. Other more enterprising farmers are arranging their own transport, now more readily available, to bring their goods directly to wholesale and retail markets in order to take advantage of higher prices.

2. Smooth, all-weather riding surfaces have reduced wear and tear on vehicle operation and maintenance. This has stimulated competition and generated an increased flow of vehicular traffic. Inflation and increasing fuel costs, however, have resulted in higher nominal transport rates. Even if one discounts the effects of higher fuel prices, operation and maintenance cost savings often seem to have been modest. There were some instances, though, of significant effects, as described on page 4 above.

3. The institutional structure for the Rural Roads Program in the provinces visited conveyed an impression of a large, overstaffed bureaucracy, created for the purpose of planning, implementing and maintaining infrastructure and roads projects, but very much underutilized. Planning seemed limited to perhaps a half dozen relatively small provincial road projects to be financed under the RRP. Implementation covered the construction of one or a few segments per year under this program and perhaps, in some cases, a few other infrastructure projects. Although 67 percent of provincial road maintenance was financed by the national government, maintenance did not appear to be implemented under a well-regulated and

organized system. Maintenance programs were developed to qualify for the national public highway funding for provincial roads. However, when such maintenance funds were received, they reportedly became a part of the overall provincial budget and were used for purposes other than those, intended.

4. Equipment shops and laboratories also conveyed impressions of overstaffing and underutilization of personnel. None of the four shops and laboratories visited by the writer demonstrated the work and activity to be expected for the size and type of staff shown in the organization charts. In fact, in all cases work activity was minimal with respect to both equipment maintenance and laboratory testing. Major equipment overhauls were contracted to private shops. The areas around the equipment shops were cluttered with older excess property equipment beyond repair and awaiting disposal.

5. Design standards appeared excessive for the relatively light-weight vehicular traffic, consisting mainly of tricycles, some jeepneys, and a few trucks and buses, whose total numbers ranged from less than 100 to over 500 per day at the sites visited. A gravel sub-base of eight inches, a gravel base of four inches and a nine-meter-wide roadway surface are inappropriate for this kind of traffic. These standards were recently revised and lower standards will be incorporated in the follow-on program.

6. The major environmental complaint was that of dust created by the increased and more rapidly moving traffic. Where this can be identified as critical, particularly in built-up areas, consideration may be given to asphalt paving of selected short roadway stretches. Otherwise, the benefits of improved access to community services together with improved drainage characteristics would tend to outweigh this complaint.

7. Traffic counts showed that vehicular traffic was approaching projected levels and in one case exceeded the projection for ten years after project completion. It should be recognized, however, that our counts -- necessarily for only one or two days -- did not take into account seasonal or even daily variations in traffic patterns.

SUMMARY TABLE

Road	Length (km)	Unit Cost		Previous Traffic (per day)	Projected Traffic[4] (per day)	Current Traffic[5]
		Road (per km)	Bridges (per lineal meter)			
Junction Vito-Vito	6.7	$28,200[1]	None	50 to 80	400 to 500	200 to 300
Mainit-San Miguel	8.0	58,200[2]	1,750	150 to 200	NA	300 to 400
Calaca-Madalunot	5.0	32,700	None	None	30 to 50	50 to 60
Pawa-Santa Magdalena	9.1	32,600[3]	NA	180	180 to 240	225
Palca	6.3	13,300	None	150	150 to 360	275
Castillejos-Nagbayan	4.4	NA	None	170	180 to 350	470
Maltana-Cebuano	7.8	11,800	500	100	140 to 500	140
Santo Tomas-San Miguel	13.8	26,200	2,690	None	220 to 300	275

1/ Includes 900 meters of concrete surfacing.
2/ Concrete surfaced.
3/ Partially asphalt surfaced.
4/ Range from one year to 10 years following completion.
5/ Period of observation varied - some results of 24-hour counts, some of 12-hour counts and some of 3 and 6-hour counts.

APPENDIX D

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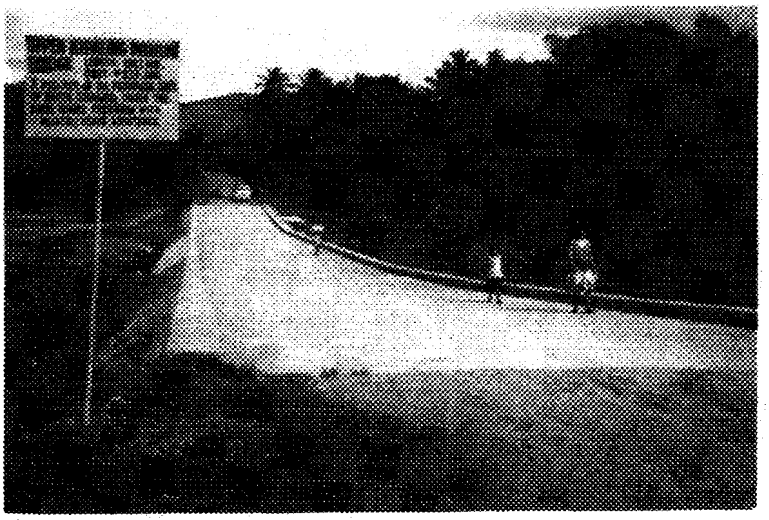
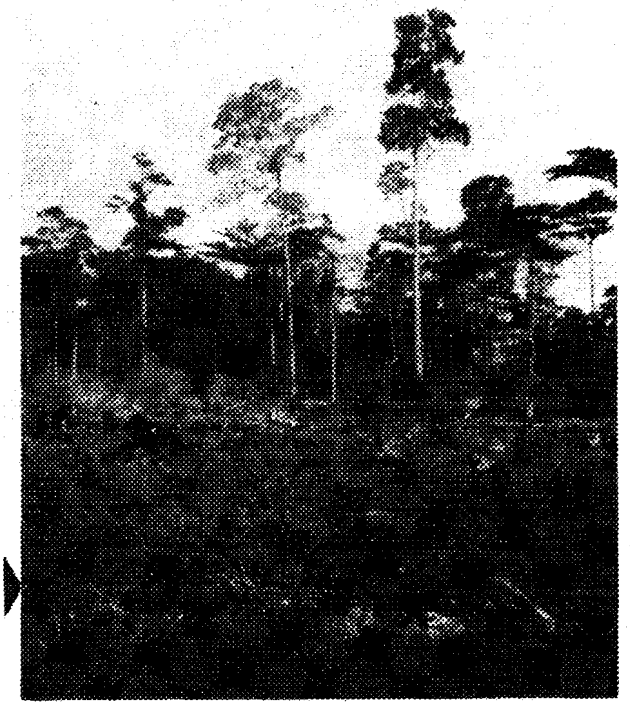
APPENDIX E

PHOTOGRAPHS

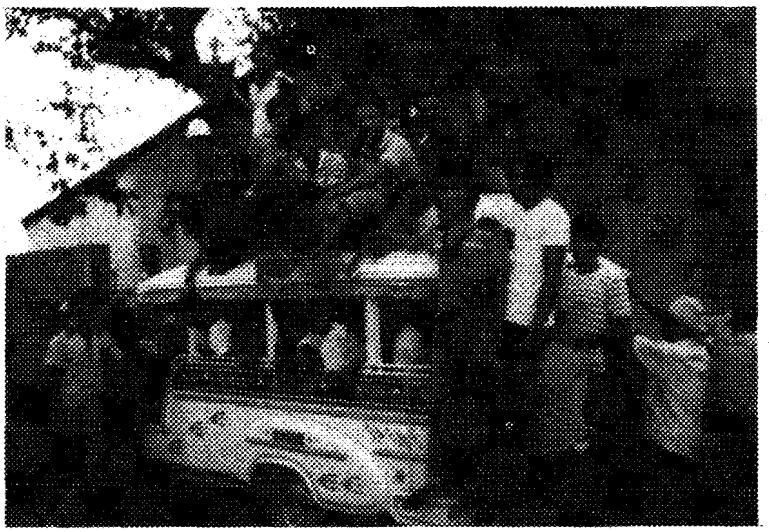


Overflow bridge on the Maltana-Cebuano Road

Second-growth forest land being cleared for rice production in the area served by the Santo Tomas-San Miguel Road



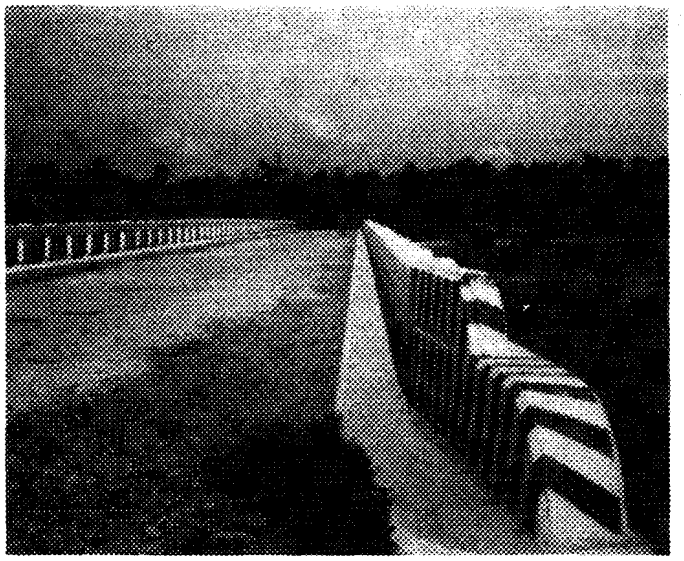
Jeepney on the Palca Road – with a few extra "passengers" for the photograph



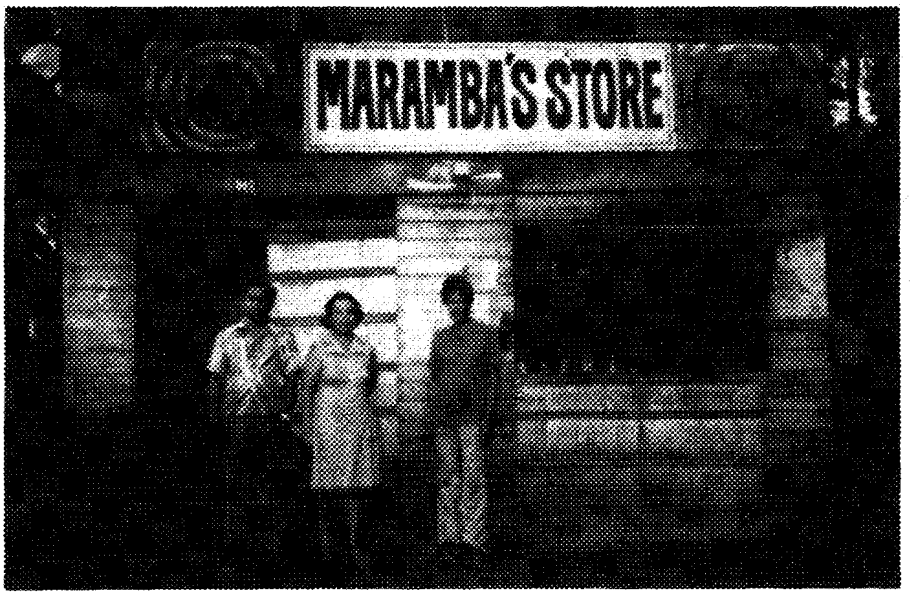
Agribusiness development along the Pandi-Angat Road

The Maltana-Cebuano Road leaving Maltana

The tricycle and the horse-drawn calesa -- the latter still widely used in Cagayan Province



This 120-meter bridge on the Santo Tomas-San Miguel Road is helping to stimulate a great deal of agricultural production -- but who will benefit most?



A relatively large sari-sari store in Maltana

The Castillejos-Nagbayan Road passing through Nagbayan

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